Fig.39
The collector circuit is filled when the fluid exit from the hole **H** (see picture n°36).

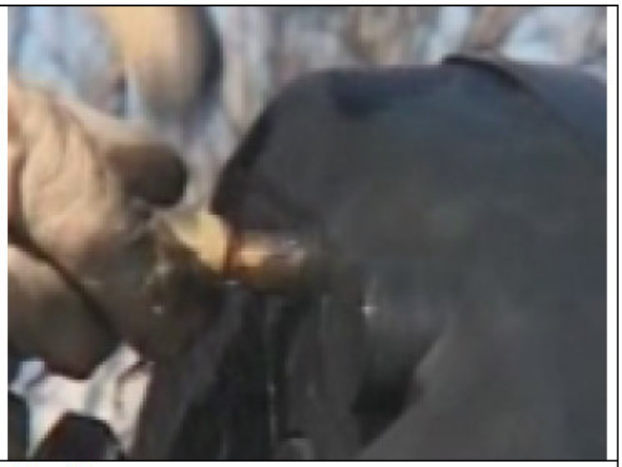


Fig.40
Connect the valve **D** on the hole **H**. Important: Don't use tools to screw but the hands.

Fig.41
Detail.

Fig.42
Detail.

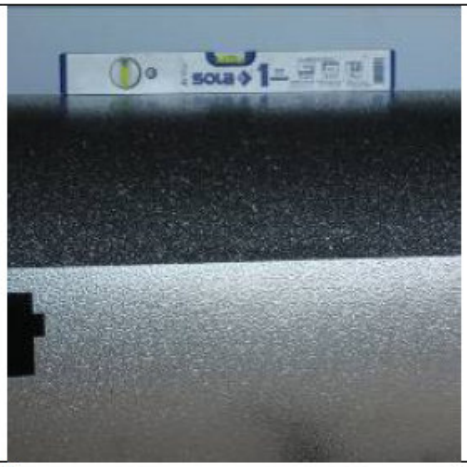


Fig.43
To verify that the left part of the tank is more high (about 3cm) than the right part.

Fig.44
The row showed the optimal inclination of the system. ***<u>Important</u>: To Verify that at the end of the installation (on the roof of the container) the inclination is right.***

Fig.45
Detail of the pipe connection.

Fig.46
Put the inox plaques on the frame for fix the collectors. There are n°8 plaques.

Fig.47
Detail. N°4 plaques for the low part of the collectors.

Fig.48
Detail. N°4 plaques for the high part of the collectors.

Fig.49
Is possible use the "z" rail included with the frame component to avoid the escape of the container from that water rain.

Fig.50
Detail. "z" rail (fig.1 pag.3)

The solar system is ready

FROST / FREEZE PROTECTION

The concentration of the Propylene Glycol solution (Heat Transfer Fluid) in the closed circuit should be determined by the minimum temperature that the system will be exposed to.

Freezing Point of Propylene Glycol (Hartgard) Solution

20% Propylene Glycol by volume	-7°C	18°F
30% Propylene Glycol by volume	-13°C	7°F
40% Propylene Glycol by volume	-22°C	-8°F
50% Propylene Glycol by volume	-34°C	-29°F

Solahart recommends using a 1 complete bottle of Hartgard in each system or a minimum concentration of 20% as this will cover most applications.

Procedure for install all the connection
(electrical and plumbing)

!!! INSTALLATION MUST COMPLY WITH LOCAL ELECTRICAL AND PLUMBING CODES AND FOLLOWING THE INSTRUCTION DETAILED IN OWNER'S MANUAL !!!

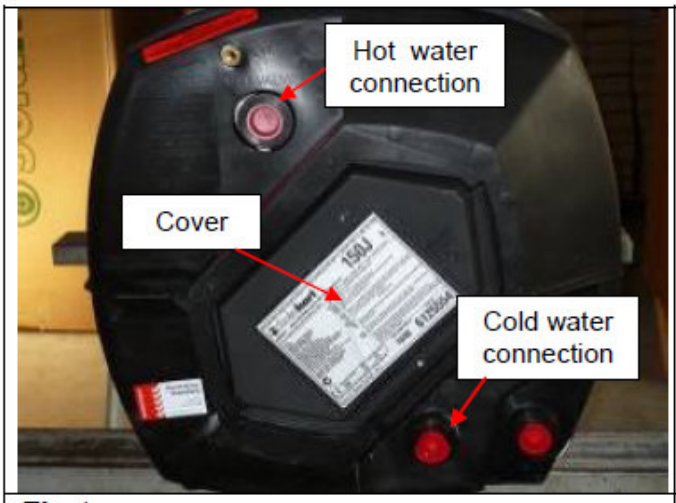


Fig.1
Detail. Connection of the tank.

Fig.2
Remove the cover (using the screwdriver included in the tools).

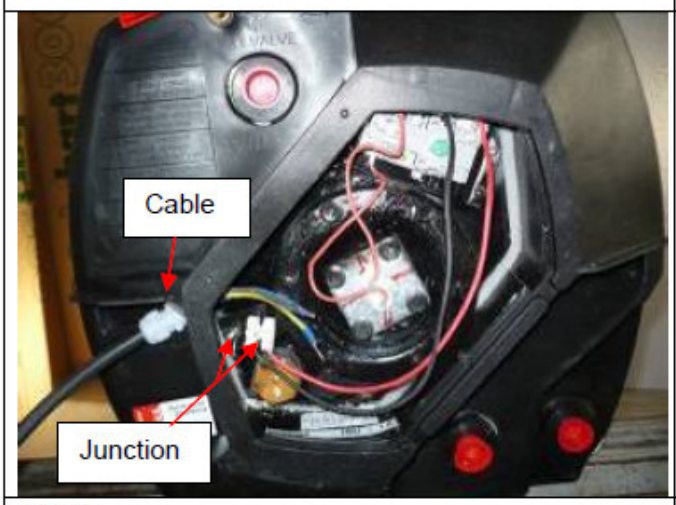


Fig.3
Connect the electrical cable to the internal junction.

Fig.4
Remove the nut to connect the ground wire using the tubular spanner.

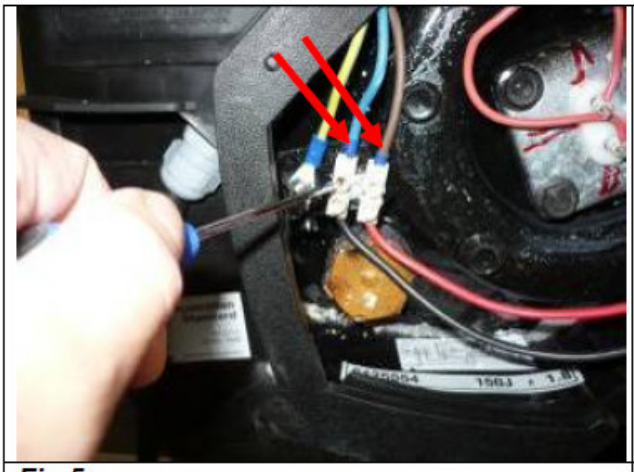


Fig.5
Connect the neutral and phase wire.

Fig.6
Close with the plastic cover.

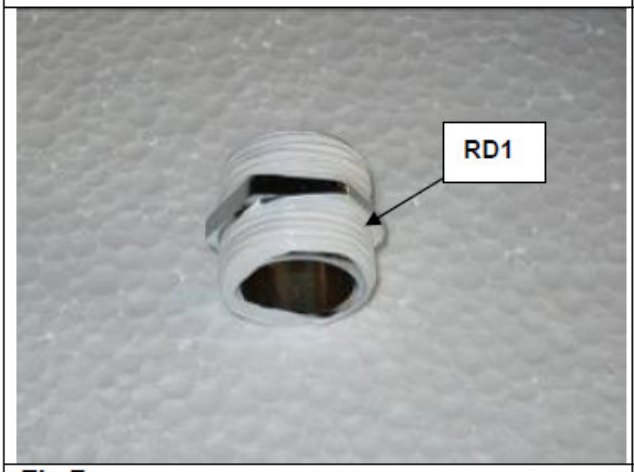


Fig.7
Coil the Teflon (included with tools) around the connection for potable water.

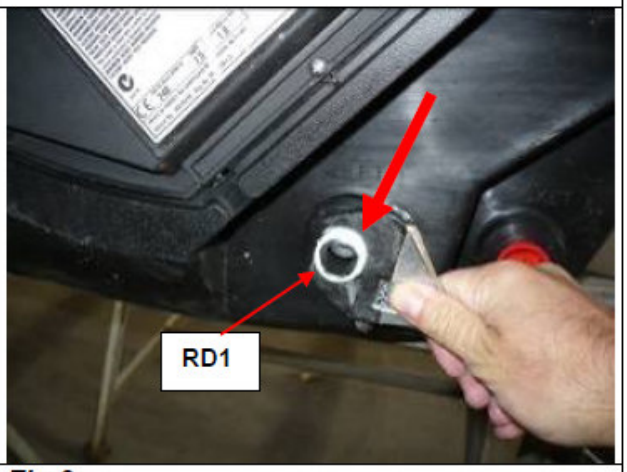


Fig.8
Install this piece to the cold (inlet) connection tank.

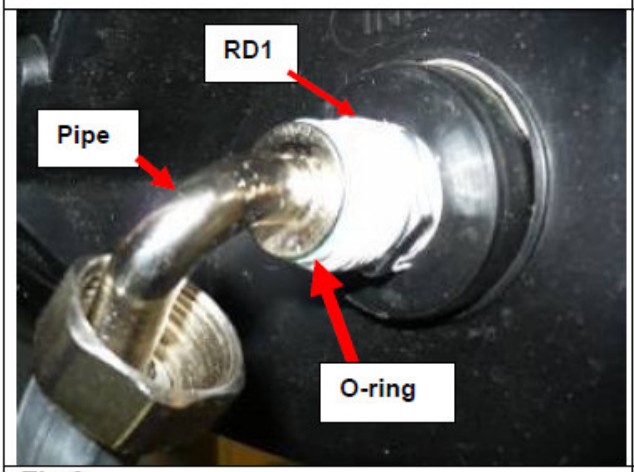


Fig.9
Connect one flexible pipe to the inlet. *Attention*: Fix the o-ring to avoid leakage.

Fig.10
Tighten the nut.

Fig.11
Coil the Teflon around **G** piece.

Fig.12
Install the G piece to the hot (outlet) connection.

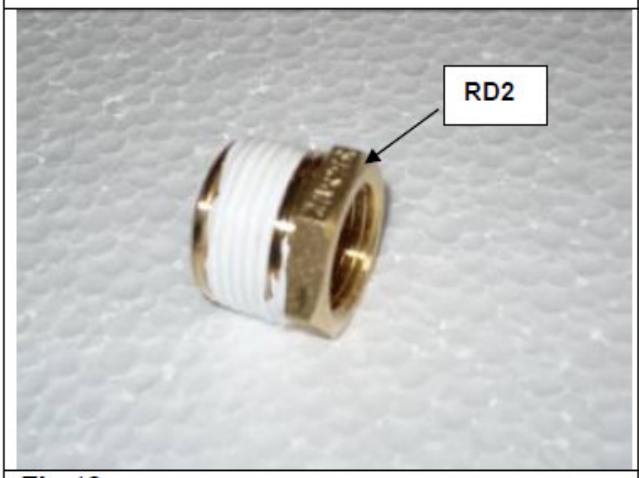


Fig.13
Coil the Teflon (included with tools) around the connection for potable water.

Fig.14
Install the **RD2** piece on the **G** piece.

Fig.15
Tighten.

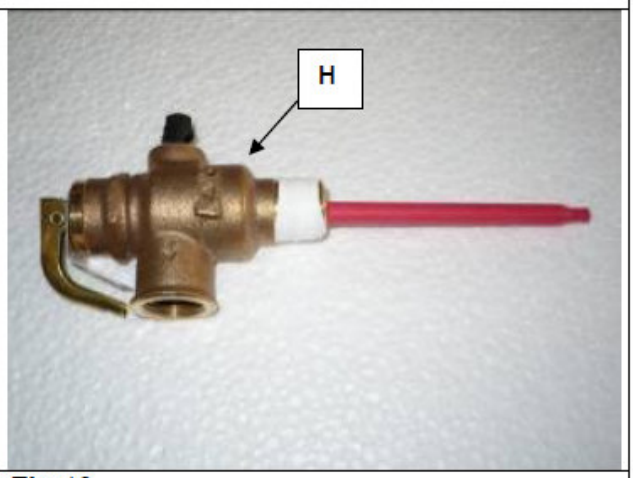


Fig.16
Coil the Teflon around the drain valve.

Fig.17
Tighten.

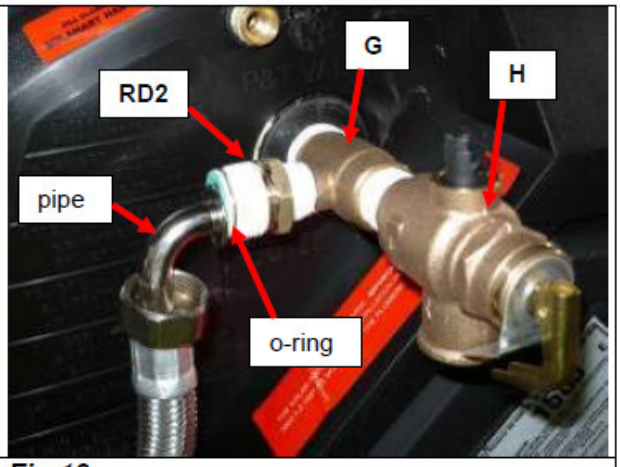


Fig.18
Install the flexible pipe as above. *Attention*: Fix the o-ring to avoid leakage.

Fig.19
Detail.

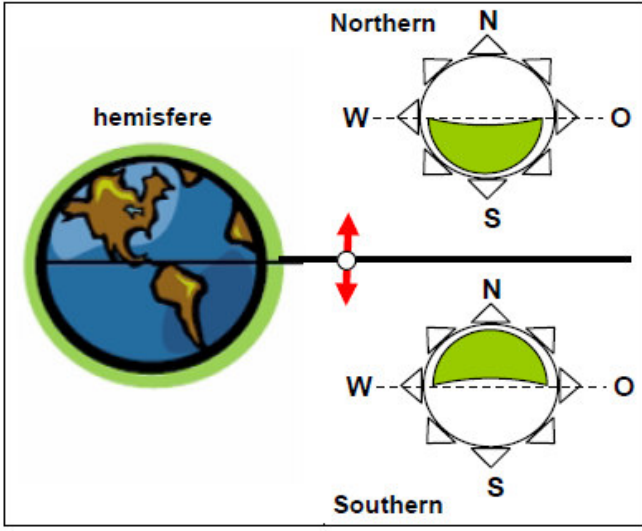
Fig.20
Detail.

Fig.21
Install the drain kit pipe (fig. 1 n°6) and fix the plastic pipe on frame.

Procedure for install the solar system to the container connection
(electrical and plumbing)

!!! INSTALLATION MUST COMPLY WITH LOCAL ELECTRICAL AND PLUMBING CODES AND FOLLOWING THE INSTRUCTION DETAILED IN OWNER'S MANUAL !!!

ORIENTATION OF THE SOLAR SYSTEM



Attention:

- Solar panels have to be placed toward the south if you are in the northern hemisphere (see in the picture northern the right "green" orientation of the system).
- Solar panels have to be placed toward the north if you are in the southern hemisphere (see in the picture southern the right "green" orientation of the system).

Caution:

The total weight of the solar system is **300 Kg**

1. Make sure that the roof is clear (there is nothing on it)

2. Place the solar system (steel frame + solar panels + 300 lt tank) on the 4 steel points **keeping the load on the forklift.**
3. Hit the steel frame in the centre of the 4 steel points to allow to put the 4 screws M8 in the correct position.
4. Fasten the 4 screws as better as you can.
5. Remove delicately the forklift.
6. Check that all the screws are well fastened.

Fig.1
Take the kit solar system with forklift.

Fig.2
Detail.

Fig.3
Detail. Roof container with 4 steel point.

Fig.4
Detail.

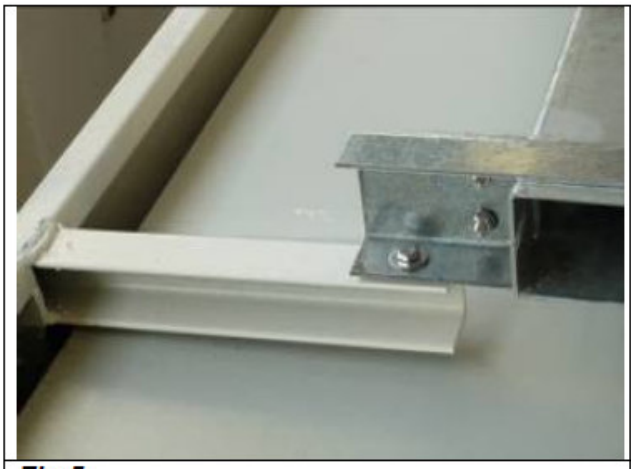


Fig.5
Detail.

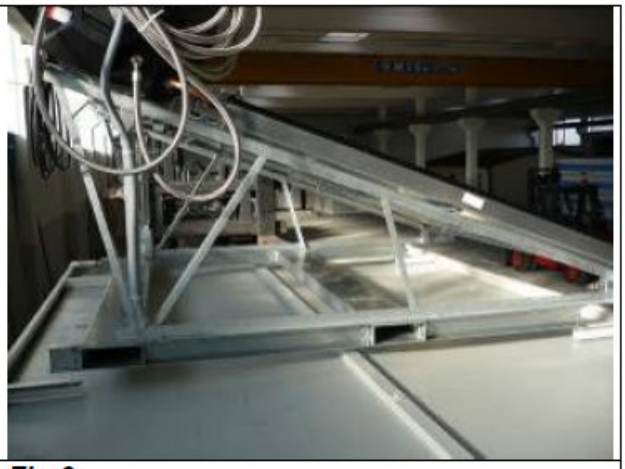


Fig.6
Detail.

Roof container plant

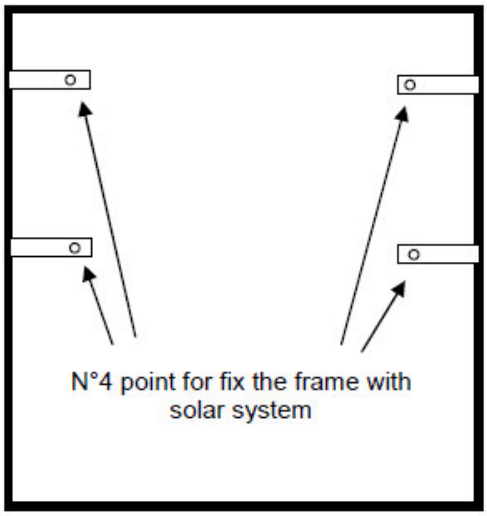
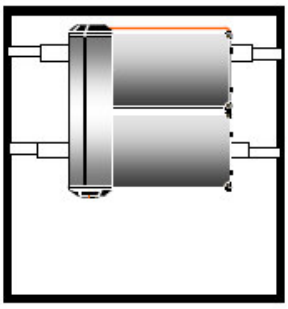


Fig.7
Detail.

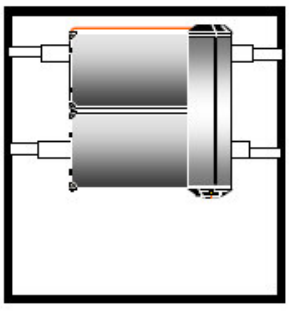
Attention:

Choose the right position of the frame in according with the notes about "Orientation of the solar system".

Fig.8
Detail.

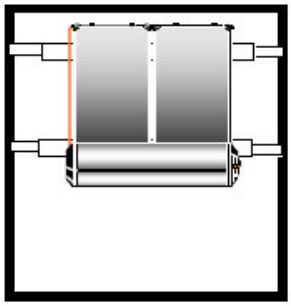


Position1

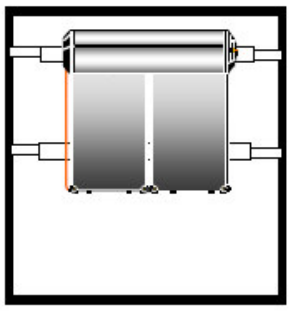


Position2

Fig.9
Detail.



Position3



Position4

Fig.10
Detail.

Note: For all the n°4 position, if necessary, is possible install on the frame the "z" rail (see pictures n°49 and n°50 of "Solar system installation" paragraph.

Procedure for the connection of the solar system to the container
(electrical and plumbing)

INSTALLATION MUST COMPLY WITH LOCAL ELECTRICAL AND PLUMBING CODES AND FOLLOWING THE INSTRUCTION DETAILED IN OWNER'S MANUAL !!!

The solar system has to be connected to:

1. internal cold water supply system (joint male 3/4 ")
2. internal hot water supply system (joint male 3/4 ")
3. internal electrical supply system

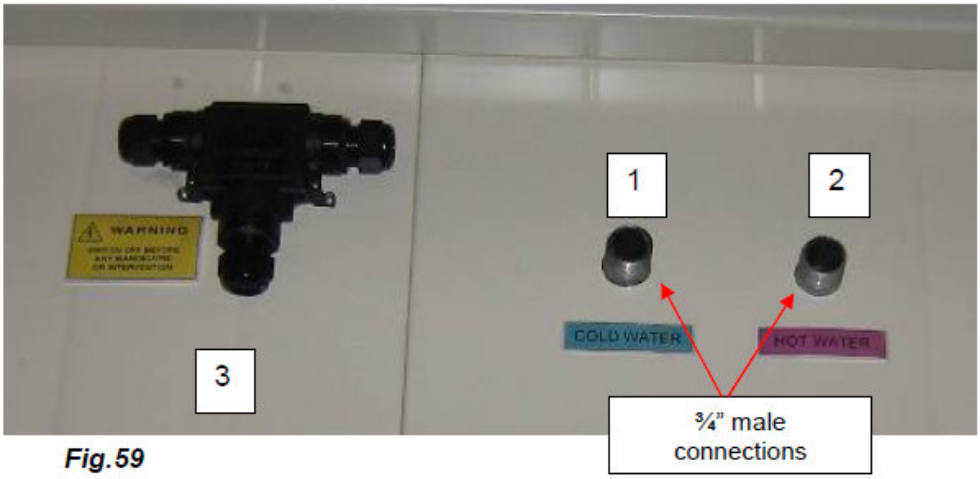


Fig.59

Caution:

- Before connecting the solar system verify that it is correctly placed and fixed on the roof of the prefabricated ablution module.
- Disconnect power before opening the tee box.

Fig.1 *Tee box*

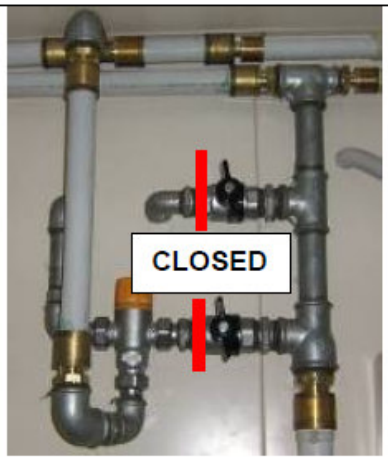


Fig.2
Close the valve for hot and cold water (vertical position)

Fig.3
Make sure that there is no power

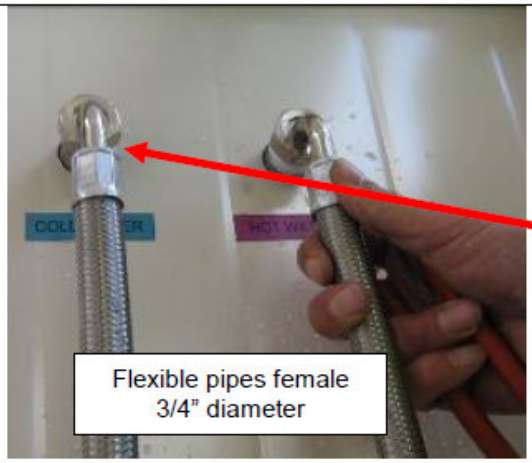


Fig.4
Connect the flexible pipes (3/4" diameter) to cold and hot water. Remember to install the o-ring.

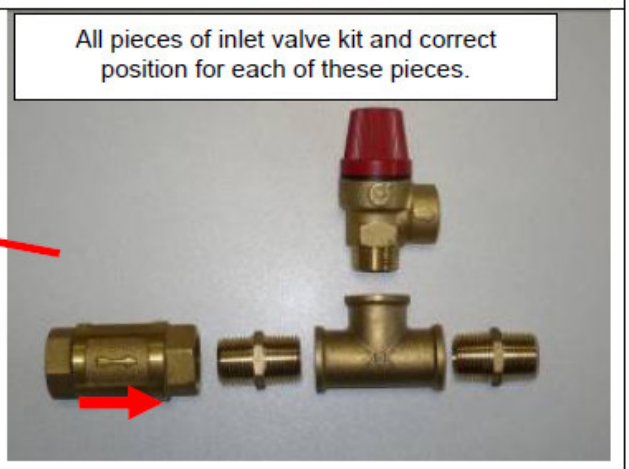


Fig.5
First of this operation is important to connect to the cold water connection the ***inlet valve kit.*** All the connection are with ¾" diameter.

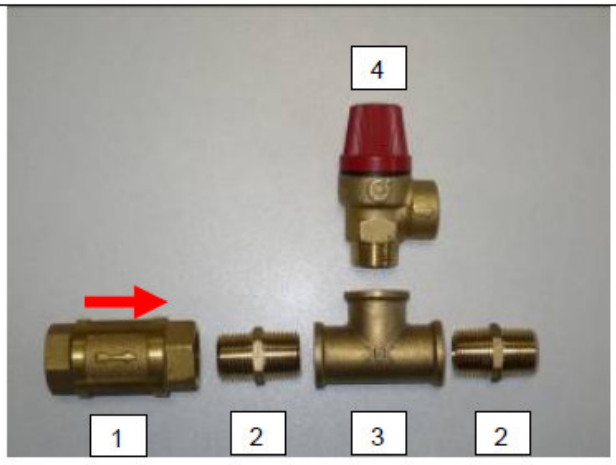


Fig.6
Note the right position for non return valve. Note the direction of the arrow.

Component of INLET VALVE KIT

1 – n°1 Non return valve ¾"
2 – n°2 connection (3/4"-3/4")
3 – n°1 Tee piece
4 – n°1 safety valve (6 bar)

Note: The valve (4) can drain only cold water

Fig.7
Detail.

Fig.8
Connect the electrical cable to the tee box

Important: If you don't want use the electrical integration (by the electrical resistance included with the solar system) don't connect the cable to the tee box.
In this case the hot water is produced only by the sun!

Fig.9
If you don't want connect the electrical integration of the solar system, go to the pictures n°16

Fig.10
Detail

Fig.11
Detail

Fig.12
Detail

Fig.13
Detail

Fig.14
Detail

Fig.15
Cable connected to the tee box

Fig.16
Open the hot water faucet to allow the air to go out of the circuit. You must push about every 20 second.
Important: Before, set HOT the position !!

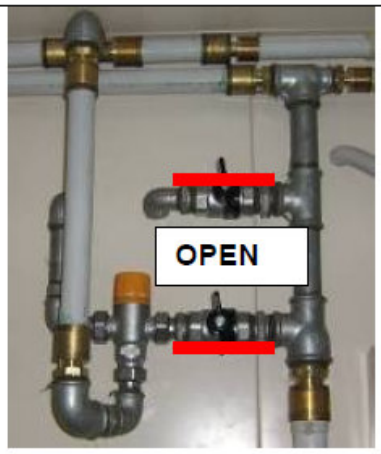


Fig.17
Open the valves (horizontal position)

Fig.18
Put the thermostatic mixing valve on position 2

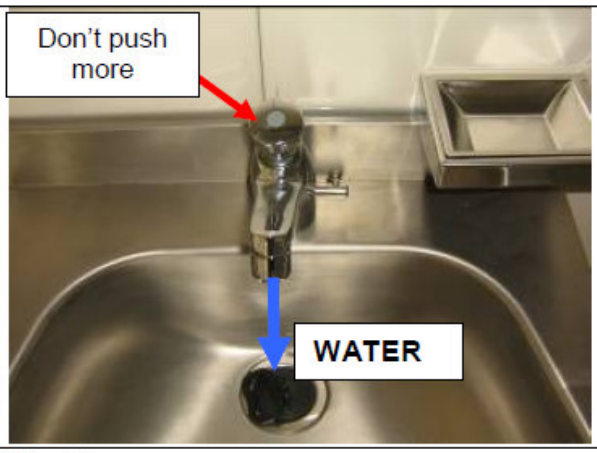


Fig.19
Only when the water comes out from the faucet, don't push more.

Fig.20
Uncover the collectors

Fig.21
Insert the socket into the plug

Fig.22
Wait some hours for having hot water

Fig.23
Cut the used straps

Attention:

In case of high thickness of dirt/sand on the collectors surface, Solahart suggest to clean the collectors only with water using a rubber pipe.

Fig.24
Detail.

Fig.25

Keep the packaging to re-utilize when the system will be remove

Procedure for the <u>disconnection</u> of the solar system from the container

Fig.1
Disconnect the electrical supply

Fig.2
Close hot and cold water

Fig.3
Disconnect the two pipes from the container for drain the water from the tank.

The water into the tank could be hot (max 99°C)

Fig.4
Disconnect the pipe from the container and drain back the potable water (300 litres) of the tank.

Fig.5
Disconnect the electrical cable of the solar system.

Fig.6
Remove the nuts that fix the frame on the container

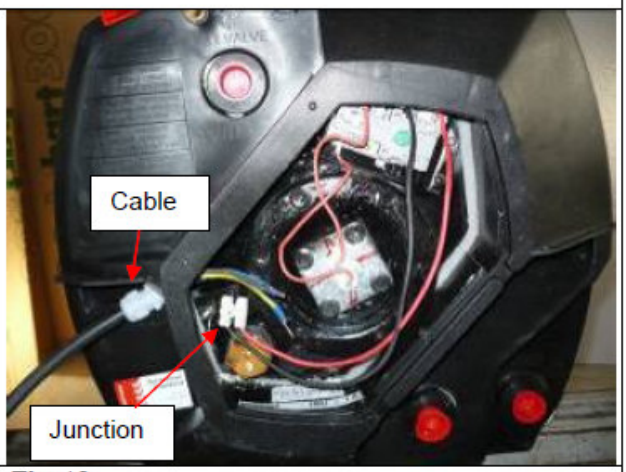
	roof and with forklift remove the system from the container to the ground.
Fig.7 Detail.	***Fig.8*** Detail.
Fig.9 Remove all the connection (electrical and plumbing) from the solar tank (for detail see the picture.	***Fig.10*** Remove hot pipe and piece with **H** valve.
	
Fig.11 Remove cold pipe.	***Fig.12*** Disconnect the electrical cable after opened the plastic cover of the tank.

Fig.13
Remove the screw for drain back the glicol of the closed circuit.

Fig.14
Remove the valve of the closed circuit with hand.

The glycol into closed circuit could be hot

(max 99°C)

Fig.15
Remove the valve of the closed circuit with hand.

Fig.16
Remove all the inox plaques from rail.

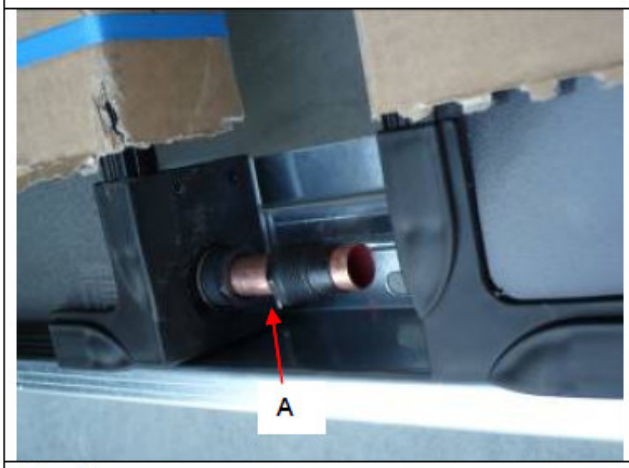


Fig.17
Remove the two pieces A.

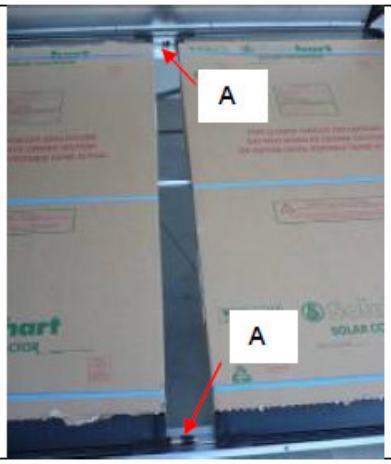


Fig.18
Detail.

Fig.19
Remove the hot curve.

Fig.20
Remove the cold pipe.

Fig.21
Remove the two collectors.

Fig.22
Detail.

Fig.23
Positioning the 2 straps.

Fig.24
Remove the two clamps.

Fig.25
With forklift remove the tank from the frame.

Fig.26
Pack all the components in the original carton boxes.

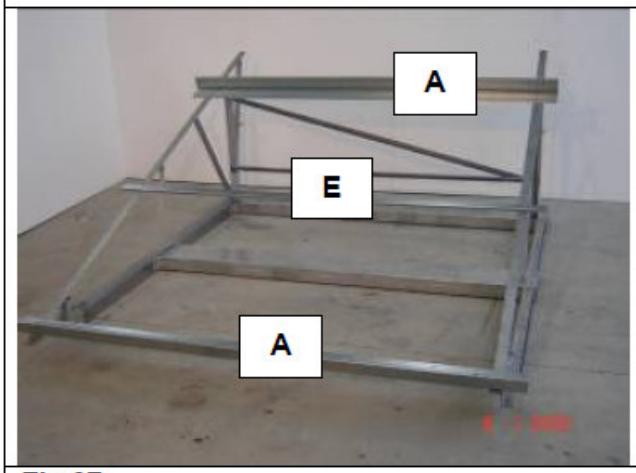


Fig.27
Dismounting all the parts of the frame.

Fig.28
Remove the 3 rails **E** and **A** **(see fig. 21).**

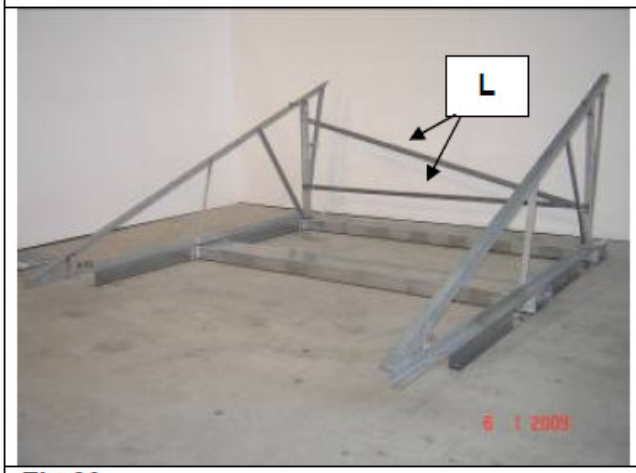


Fig.29
Remove the 2 pieces **L**.

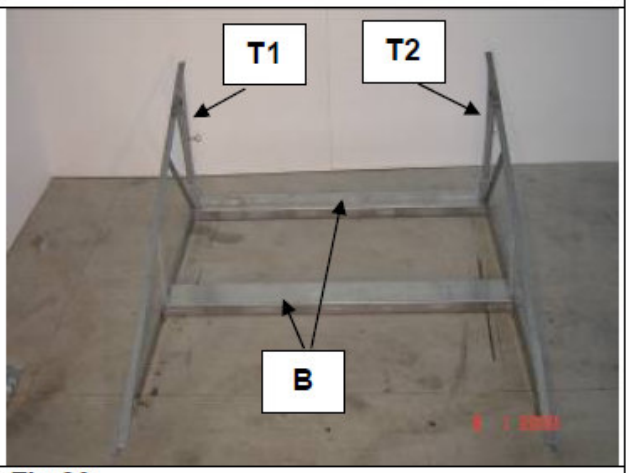


Fig.30
Remove the 2 pieces **B**.

Fig.31
Connect the two part T (**T1** and **T2** in the fig.30) with clamps.

Fig.32
The frame at the end.

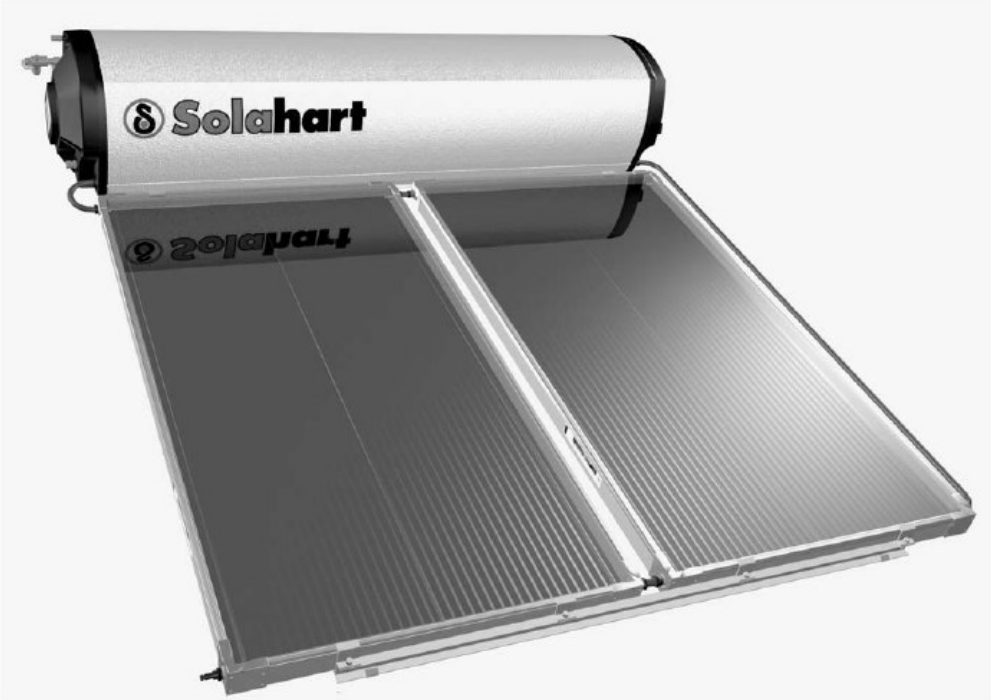
18 SOLAHART OWNER'S MANUAL

OWNER'S MANUAL

Includes Installation Instructions

SOLAR WATER HEATERS

Solahart Industries Pty Ltd
ABN 45 064 945 848



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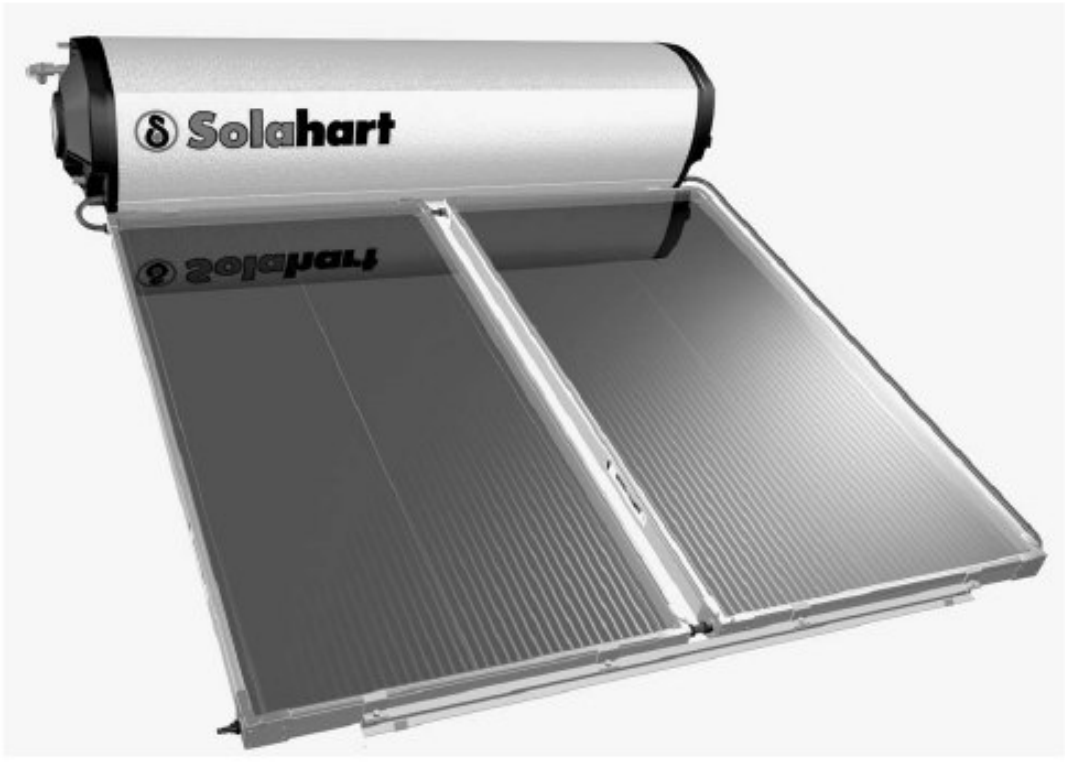
WORLD'S LEADING TECHNOLOGY

Your Solahart is equipped with the latest technology in solar water heaters. The Closed Circuit Series feature collectors that contain a special heat transfer fluid called 'Hartgard' which acts to enhance the performance of your Solahart water heater. 'Hartgard' is a special food grade solution and is the only solution permitted to be used in the closed circuit systems. Hartgard has been approved by the National Health and Medical Research Council of Australia. Unlike water, 'Hartgard' fluid resists freezing, allowing Solahart to guarantee the Closed Circuit Series against frost damage. Solahart water heaters are so effective that they can save you money anywhere in the world. How much you save depends on local conditions and your hot water usage patterns.

The 'L' and 'L Free Heat' Series uses a direct heating collector, incorporating state-of-the-art manufacturing technology to ensure the same quality and finish as the Closed Circuit Series.

It is important that you select the correct water heater for your local conditions and your family's needs.

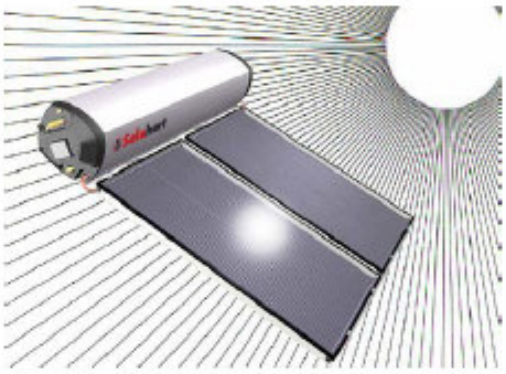
WARNING: Your Solahart Closed Circuit Systems are protected by our exclusive 'Hartgard' fluid. The fluid is contained in the solar panels and the heat exchanger jacket around the main cylinder. Although the fluid is of food grade quality, it is important that it is not ingested. As with all water heaters, we recommend that you do not drink or cook with the hot water from your Solahart heater.



HERE'S HOW IT WORKS

The Solahart Closed Circuit Series uses a heat exchanger that operates under the Natural Thermosyphon Principle. The 'L' Series uses a direct heating method that relies upon the same Thermosyphon Principle, but circulates potable water through the collectors.

The Solahart collectors absorb solar energy. The low-iron content solar glass allows more radiation to pass through and be retained than other traditional float glass systems.



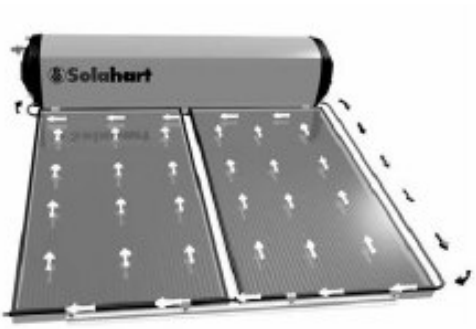


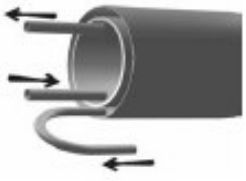
Diagram of Closed Circuit Series

In the Closed Circuit Series, heat is absorbed by the collector and passed to the 'Hartgard' heat transfer liquid inside the collector. As the temperature of the 'Hartgard' increases, the hot fluid rises up through the collector by the Natural Thermosyphon Principle, into the heat exchanger jacket around the potable water storage tank. Here, the heat is transferred to the potable water, cooling the 'Hartgard' fluid.

The cooler fluid is then forced back down into the collectors through the displacement action of the hot fluid rising up into the heat exchanger jacket.

The cooler fluid is again heated in the collectors and rises back up to pass the heat to the potable water in the storage tank. This process repeats until all water in the storage tank is heated.

'L' Series



Closed Circuit Series

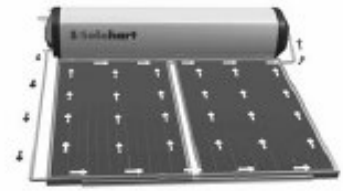


Diagram of L Series

For the 'L' Series, heat is collected directly by the potable water circulating through the collector. As the potable water heats up, it rises by the Natural Thermosyphon Principle, directly to the storage tank. As the heated potable water travels through to the storage tank, the cooler potable water returns to the collectors. This process repeats until all water in the storage tank is heated.

OPERATING HINTS

The overall performance and power cost savings that you will obtain from your Solahart water heater will depend on your hot water usage pattern and the usage of your electric or gas booster.

With a two panel, 300 litre Solahart hot water heater, on a clear winter day, the collectors can raise the tank temperature to approximately twice the daily maximum temperature. For example on a clear 15ºC day the tank temperature can reach approximately 30ºC. The supplementary booster should then be used to raise the water temperature to at least 60°C before the water is used.

A booster switch, or alternatively a time clock, may be fitted to the system to turn the booster on when required. This method can increase energy savings.

The following hints are provided to assist you in selecting the best pattern of hot water usage for your solar water heater.

1) Solar energy input is greater on sunny days between 10am, and 3pm. If possible, schedule your heavy washing or laundry for as close as possible to the middle of the day.
2) Keep trees in the sun's path at a level where the collectors are not shaded at any time during periods of effective solar radiation.

Off Peak Power

If your Solahart water heater is connected to an 'Off Peak' (night rate) electrical supply, it is important to remember that the booster may only operate late at night. On cloudy days the tank may only gain a small amount of energy during the day. Careful planning will be required to avoid running out of hot water if large quantities are drawn during the day.

In areas where a 'Day Rate' electrical switch is permitted, the storage tank can be boosted manually to ensure hot water is available at the end of the day.

Over-Night Temperature Stabilisation

Over-night temperature stabilisation is the reduction in water temperature, as the hot water at the top of the storage cylinder transfers some of its heat to the cooler water in the lower section of the cylinder. This effect is often perceived as heat loss, but is actually the redistribution of stored heat more evenly over the entire contents of the storage tank. This may make it necessary to use the booster to raise the water in the top section of the cylinder back to an acceptable temperature.

Over-night temperature stabilisation is most evident in the morning if the booster switch or time clock is left OFF over-night.

Using Your Solahart Heater as a Pre-Heater

Your Solahart can be used as a pre-heater to an existing heater provided that:

1) The power supply to the Solahart is not connected.
2) The existing water heater is thermostatically controlled, **not flow controlled**, except when used in conjunction with an electronic instantaneous water heater. (Note: For flow controlled water heaters, the heater can act as a supplementary heat source only, not as a pre-heater, and the heater can be connected in a **parallel circuit only**, via a changeover valve(s)).
3) The operating pressures of the two heaters are compatible or reduced to the lower of the two heaters.
4) The existing heater has sufficient thermal capacity in its own right to supply normal water requirements and is complete with its own controls and valves and these are not interfered with.

FACTS YOU SHOULD KNOW ABOUT YOUR SOLAHART WATER HEATER

Hot Hot Water!

Your Solahart water heater will generate hot water quickly and efficiently. Under normal family use, it will operate between 60ºC and 70ºC. However, the temperature can exceed this and under certain circumstances may be as high as 95ºC. This can occur during prolonged periods of direct sunlight and particularly in summer or long periods of reduced water usage. Extreme care should be taken in these circumstances.

Check the water temperature before use, such as when entering a shower or filling a bath or basin, to ensure it is suitable for the application and will not cause scald injury.

We recommend and it may also be required by regulations, that an approved temperature limiting device be fitted into the hot water pipe work to the bathroom and ensuite when this water heater is installed. This will keep the water temperature below 50°C at the bathroom and ensuite. The risk of scald injury will be reduced and still allow hotter water to the kitchen and laundry.

WARNING

This water heater is not intended to be operated, adjusted or tampered with by young children or infirm persons. Young children should be supervised to ensure they do not interfere with the water heater.

The removal of the front cover will expose 240 V wiring. It must only be removed by an authorised or service person.

Care should be taken not to touch the pipe work connecting the solar storage tank and the solar collectors. Very high temperature hot water can be generated by the solar collectors under certain conditions, and will flow through the pipe work from the solar collectors to the solar storage tank.

Period of Reduced Usage or Holidays

If the water heater is left unused for two weeks or more a small quantity of hydrogen gas, which is highly flammable may accumulate in the top of the water cylinder. To dissipate this gas safely, it is recommended that a sink hot tap be turned on for several minutes. Do not use a dishwasher, clothes washer or other appliance for this purpose. During this procedure there must be no smoking, open flames or any electrical appliance operating nearby. If hydrogen is discharged through the tap it will make an unusual sound like air escaping.

'Hartgard' Solution

'Hartgard' is a blue, non-toxic, propylene glycol fluid and when mixed with water, provides the Heat Transfer Fluid in Closed Circuit systems. 'Hartgard' is used to lower the freezing temperature of the Heat Transfer Fluid and so provides protection against freezing (for the correct % of Hartgard in the Heat Transfer Fluid, refer to the section on Frost / Freeze Protection).

Should the water from your Closed Circuit Series Heater appear blue, then this may indicate a leak of 'Hartgard' from the jacket into the potable water. While **'Hartgard' is a food-grade solution and not hazardous to health,** the blue colour in the water indicates a fault and your Solahart serviceman should be contacted to inspect the system.

Over-temperature Protection System

The Closed Circuit Series high performance systems have a means of controlling the maximum temperature of the water in the storage tank. These systems contain an in-line 'Hartstat' valve, located between the hot outlet of the collectors and the inlet to the tank heat exchanger. This valve closes when the tank has reached a sufficiently high temperature, thereby preventing further heat transfer to the tank, and thus limiting its temperature to more acceptable levels.

Corrosion Protection

Corrosion protection of the potable water tank is obtained by using two coats of vitreous enamel and the use of a sacrificial anode.

MAINTENANCE

Service Calls

Should your Solahart not provide hot water please check the following before requesting a service call:

1) Shading from trees is not excessive and is not covering the collectors for all or part of the day.
2) Hot water usage is not excessive.
3) Hot water is not leaking from within the plumbing system.
4) Booster switch and/or time switch is turned ON.
5) Booster circuit fuse or circuit breaker is sound.
6) Electric or gas meter speeds up when the booster switch is turned ON after being OFF.

Contact your local Solahart dealer if all of the above have been checked and there is still no hot water.

Six Monthly Service

TEMPERATURE PRESSURE RELIEF VALVE

This valve is near the top of the water heater and is essential for its safe operation. It is possible for the valve to release a little water through the drain line during each heating period. This occurs as the water is heated and expands by approximately 1/50 of its volume.

Continuous leakage of water from the valve and its drain line may indicate a problem with the water heater

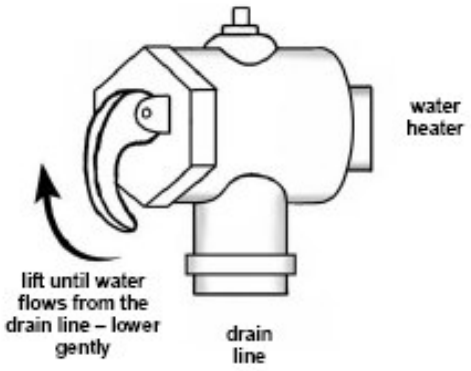
WARNING: Never block the outlet of this valve or its drain line for any reason.

Operate the easing lever on the temperature pressure relief valve once every six months. **It is very important that the lever is raised and lowered gently.**

DANGER: Failure to do this may result in the water heater cylinder failing, or under certain circumstances, exploding.

If water does not flow freely from the drain line when the lever is lifted, then the water heater should be checked by your nearest Solahart Dealer.

The temperature pressure relief valve should be checked for performance or replaced at intervals not exceeding 5 years, or more frequently in areas where there is a high incidence of water deposits.



EXPANSION CONTROL VALVE

In many areas, including South Australia, Western Australia and scaling water areas, an expansion control valve is fitted to the cold water line to the water heater. Water will flow from its drain line during the heating period.

Operate the easing lever on the expansion control valve once every six months. **It is very important that the lever is raised and lowered gently.** The expansion control valve should be checked for performance or replaced at intervals not exceeding 5 years, or more frequently in areas where there is a high incidence of water deposits.

COLLECTOR GLASS

Ensure the glass on your solar collectors is free of dust, salt spray or any other matter, which may reduce the effectiveness of the solar collectors. If the collector glass becomes dirty, hose down, or, if the collectors are accessible, wash the collector glass with water and a soft brush when the collectors are cool. Have any trees trimmed which may shade the solar collectors.

Major Service (Usually Every Five Years)

This service should be performed every five years, or more often in poor water quality areas (refer to Table below).

THE MAJOR SERVICE CAN ONLY BE CARRIED OUT BY YOUR LOCAL SOLAHART DEALER OR AUTHORISED SERVICE REPRESENTATIVE.

Note: The major service and any replacement of components which have not failed are not included in the Solahart warranty.

1) Check the closed circuit fluid level (Closed Circuit Series only).
2) Replace the pressure/temperature operated relief valve. (Part No. 45-1104).
3) Flush the cold water relief valve. (Part No. 45-1103).
4) Where fitted, check the electric element for excessive calcium build up or corrosion. Replace if necessary.
5) Visually check the unit for any potential problems, eg. broken glass, excessive dust build-up, shading etc.
6) Carefully inspect all connections.
7) Drain and flush out tank sediment build-up (if any) (Refer to instructions for emptying the water heater on Page 7).
8) Drain and flush out collectors ('L' Series only) (Refer to instructions for emptying the water heater on Page 7).
9) Replace the anode.
10) For units fitted with a Gas Booster check the following:
    i) Condition of the spark electrode.
    ii) Condition of the flue terminal gasket.
    iii) Build up of dust on the fan.

Water Quality - Is it Suitable for the Solahart Water Heater?

Your Solahart heater is suitable for use with water with a total dissolved solid content less than 1,000 ppm and for which the total hardness does not exceed 200 ppm $CaCO_3$. Water supplies having calcium hardness ($CaCO_3$), and an alkalinity in excess of 150 ppm should be treated by a softening process prior to use with this heater to prevent scaling and damage to the electric booster element.

A water analysis can be obtained from your water supply authority.

Anode Replacement Period

The tank is lined with two coats of high quality vitreous enamel. The sacrificial anode is a low-cost item that is simple to replace. All metals corrode in hot water. Copper and stainless steel tanks generally are not fitted with anodes and therefore rely on the inherent properties of the metal to limit the corrosion rate. Replacing the anode regularly is less expensive than replacing the complete tank.

Water quality details should be obtained from the water authority where special water supplies are used. The following table is a guide to anode replacement intervals, and to system Major Service intervals.

Total Dissolved Solids (ppm)	Recommended Anode Replacement/Major Service Interval
0 - 600	5 years
600 - 1,000	3 years – an aluminium anode is required
Over 1,000	Less than 2 years – an aluminium anode is required

Generally, where the water is supplied from a bore or well, the quality of the water will be such that a three-year anode change (or less) will be required. A water analysis is recommended for these locations.

To replace the anode the Solahart serviceman will do the following;

1) Turn off the electricity or gas supply (which ever is applicable).
2) Turn off the water supply.
3) Release the water pressure at the pressure/temperature relief value by holding the relief arm open.
4) Remove the terminal cover plate or flue cowl (for units fitted with gas booster).
5) Unscrew the anode nut located to the left of the electric element (or burner tube) and withdraw the old anode.
6) Insert the new anode assembly into the cylinder through the anode socket.
7) Tighten the new anode nut, turn on the water supply, and check that the seal on the nut is watertight.
8) Re-fit the cover (or flue terminal). Open a hot water tap to dispel air from the tank, or operate the pressure/temperature relief value.
9) Turn on the electricity or gas supply (which ever is applicable).

DO NOT TURN POWER ON UNTIL THE HEATER IS FILLED WITH WATER OR DAMAGE TO THE HEATING ELEMENT WILL RESULT

To Empty the Water Heater

Note that the potable water supply to the system should not be switched off unless the Collectors are covered by a secured opaque material.

1) For Closed Circuit Series, securely cover the collectors from sunlight with cardboard or other opaque material *BEFORE* emptying the water heater.
2) Turn off the electricity or gas supply (whichever is applicable).
3) Flush cold water through the tank in order to cool both the tank and the closed circuit fluid.
4) Do not drain the tank, as it is recommended the potable water tank remain pressurised until the closed circuit pressure is relieved.
5) Turn off the water supply.
6) For Closed Circuit Series, relieve the pressure in the jacket by removing the PR6 jacket relief valve. Extreme care should be taken when removing the valve as the jacket fluid could be at high temperature and under pressure.
7) Release the water pressure at the pressure/temperature relief valve by holding the relief arm open.
8) Disconnect the cold water inlet and allow the water to drain out via a hose fitted to the cold water inlet connection.
9) Avoid contact with the hot water and ensure that the hose safely discharges the hot water away from the roof area.
10) Hold open the tank relief lever to allow air into the storage tank.
11) For 'L' Series only, unscrew and remove the bung plug on the bottom right-hand corner of the right-hand collector.

PR6 / PR200 Jacket Pressure Relief Valve

The heat exchange jacket has a relief valve located in the vent pipe of the jacket. This relief valve is to prevent over-pressurisation of the closed circuit either due to incorrect filling or abnormal operating conditions. During the heater's first summer season, fluid will discharge from the relief valve until the ideal closed circuit fluid volume is established. Discharges from the valve after this time could indicate the heater is not operating efficiently. Under these circumstances you must contact your nearest Solahart service centre immediately. Do not attempt to service the heater yourself.

When operating in daylight the heat exchange circuit will be pressurised, and will contain a mixture of superheated water and steam. Do not remove the PR6 / PR200 valve during operation, as there may be a very high SCALDING risk present.

Collector Glass

To prevent rapid deterioration of the collector, broken glass should be replaced immediately.

WARNING: Collector glass MUST NOT be replaced whilst the solar collector is on the roof.

In extremely dusty areas such as mining towns and locations adjacent to dust forming plants, it is recommended that the glass cover of the collector be washed clean at least every three months, should adequate rain not have fallen in this period.

Insurance

Warranty does not cover breakage of collector glass. It is recommended that the household insurance policy cover the collector glass and/or damage to the water heater, especially in cyclonic areas and in locations where hail is likely to occur.

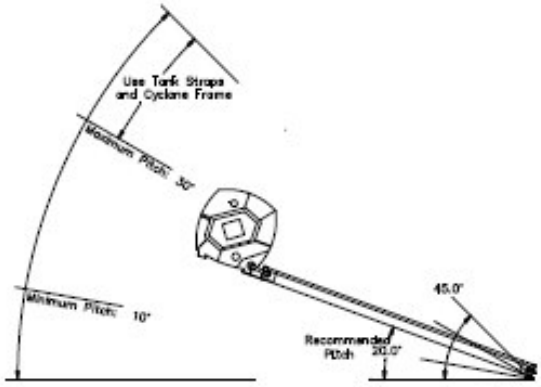
INSTALLATION INSTRUCTIONS - ALL MODELS

INSTALLATION MUST COMPLY WITH LOCAL ELECTRICAL AND PLUMBING CODES

LOCATION

For optimum performance, the heater should be installed facing the equator (South in the Northern Hemisphere, North in the Southern Hemisphere). ALWAYS USE A COMPASS TO CHECK ORIENTATION. Deviation from the equator of up to 45° East or West has little effect on total annual solar contribution (approximately 5 per cent). If it is not possible to face the equator, the decision of either an EASTERLY or WESTERLY bias must be made. If the majority of hot water usage is before 2 p.m. favour an EASTERLY bias. If the majority of hot water usage is after 2 p.m. favour a WESTERLY bias.

Ideally, the heater should be installed on a pitch equal to the geographic latitude of the place of installation. However, variation in the pitch to within ± 20° of the latitude will have little effect on the total annual solar contribution (nominally around a 5 per cent reduction). The minimum allowable angle of pitch of the heater is 10°, to ensure sufficient pitch for thermo syphoning and glass cleaning. At pitches greater than 30°, the system must be installed using special tank straps and mounted on a cyclone frame. These items are available from your local Solahart supplier.



If it is necessary to face the solar hot water heater 45° to either the East or the West, a lower pitch installation will give better performance. In such cases, the addition of a third panel to the system may be more aesthetically, economically and thermally beneficial than mounting the heater on roof brackets to face the equator.

THE HEATER MUST BE INSTALLED ON AN ADEQUATELY SUPPORTED AREA OF ROOF, as close as possible to the most frequently used hot water outlet, or existing water heater system in retrofit installations. The heater must be installed in an area that is free of shade all year round. Ensure that trees do not shade the heater, particularly in winter.

NOTE: The element/anode end of the Tank should be placed no nearer than ¾ length of the Tank, to any wall or obstruction, so that the anode can be replaced during a service.

ELECTRICAL CODES

Local codes in Australia require all electrical work to be performed by a qualified electrician. ALL INSTALLATIONS ARE TO BE IN ACCORDANCE WITH LOCAL ELECTRICAL CODES APPLICABLE IN YOUR AREA. The power rating and current requirement of your Solahart heater will be specified on the heater's data plate, located on the cover to the electrical cavity.

All electric wiring should be enclosed in suitable weatherproof conduit with watertight fittings. An ON/OFF switch may be installed in the home at a convenient location, eg: in the kitchen or laundry. An isolation switch MUST be installed in the meter box for service work on the unit.

DO NOT TURN ON THE ELECTRICAL POWER TO THE HEATER'S ELEMENT UNTIL THE STORAGE TANK IS FILLED WITH WATER.

Failure to do so will cause the electric booster element to burn out. If water and/or power are not available on completion of installation, tape the booster control switch in the OFF position and place a warning label "DO NOT TURN ON ELECTRICITY UNTIL FILLED WITH WATER" on the electrical booster control switch.

CONTROL THERMOSTAT/SAFETY CUT-OUT COMBINATION SWITCH

A combination thermostat/safety cut-out is installed to control the electrical heating element to the factory pre-set temperature of 60°C. Individual situations may require this setting to be altered. Only qualified electricians or Solahart service contractors are permitted to adjust the thermostat. The safety cut-out will de-energise the element should the temperature within the tank reach 87°C when the element is activated.

PLUMBING NOTES

All installations are to be in accordance with the building and plumbing codes applicable in your area. Australian codes require all plumbing work to be performed by a qualified plumber.

Note that any pipes that are required to enter to the house either through a wall, ceiling cavity or roof need to be fully sealed and waterproofed and should comply with local building codes and practices.

PLASTIC PIPING SHOULD NOT BE USED IN ANY HOT WATER PIPING RUNS, DUE TO THE HIGH OPERATING TEMPERATURE AND PRESSURE OF SOLAR WATER HEATERS.

TEMPERATURE & PRESSURE RELIEF VALVE

A combined temperature and pressure relief (TPR) valve (Part No. 45-1104) is fitted to the connection end of the tank to limit both the tank water pressure to 1000 kPa and the tank water temperature to 99°C. It is MANDATORY that this TPR valve be fitted in all cases, except where the storage tank is vented to atmosphere through an open pipe. When applying Teflon sealing tape to the thread of the TPR valve, ensure that the tape is at least 3 mm back from the end of the thread to prevent tape fouling the valve seat.

The TPR valve should be operated once every six months to remove lime deposits and to verify that it is not blocked. To operate the TPR valve hold the relief arm lever open. **It is important that the lever is raised and lowered gently.**

DANGER: Failure to do this may result in the water heater cylinder failing, or under certain circumstances, exploding.

The TPR valve is shipped in the pipe kit and must be fitted before the water heater is operated. Before fitting the TPR valve, make sure the probe has not been bent. Seal the TPR valve thread with Teflon tape - never hemp, ensure that the tape is at least 3 mm back from the end of the thread to prevent tape fouling the valve seat. Screw the valve into the correct opening leaving the valve outlet pointing downwards. Do not use a wrench on the TPR valve body - use the spanner flats provided.

Continuous leakage of water from the TPR valve and its drain line may indicate a problem with the water heater

WARNING: Never block the outlet of the TPR valve or its drain line for any reason.

TPR VALVE DRAIN

A copper drain line must be fitted to the TPR valve to carry the discharge clear of the water heater. Connect the drain line to the TPR valve using a disconnection union. The pipe work from the TPR valve to the drain should be as short as possible and fall all the way from the water heater with no restrictions. It should have no more than three right angle bends in it. Use DN15 pipe. The outlet of the drain line must be in such a position that flow out of the pipe can be easily seen (refer to AS/NZS 3500.4) - but arranged so hot water discharge will not cause injury, damage or nuisance. The drain line must discharge at an outlet or air break not more than 9 metres from the TPR valve.

In locations where water pipes are prone to freezing, the drain line must be insulated and not exceed 300 mm in length. In this instance, the drain line is to discharge into a tundish through an air gap of between 75 mm and 150 mm.

WARNING: As the function of the TPR on this water heater is to discharge high temperature water under certain conditions, it is strongly recommended the pipe work downstream of the TPR valve be capable of carrying water exceeding 93°C. Failure to observe this precaution may result in damage to pipe work and property.

EXPANSION CONTROL VALVE

Local regulations may make it mandatory to install an expansion control valve (ECV) in the cold water line to the water heater. In other areas, an ECV is not required unless the water saturation index is greater than +0.4. However, an ECV may be needed in a corrosive water area where there are sufficient quantities of silica dissolved in the water. For this Solahart Water Heater an RMC H50 Cold Relief Valve (part no 45-1103) is used as the ECV.

The ECV must always be installed after the TRIO valve (part no 33-1675), and must be the last valve installed prior to the water heater (see a typical cold water configuration page 10). A copper drain line must be run separately from the drain of the TPR valve. The TRIO valve in the cold water inlet line also enables the water to be turned OFF for servicing purposes.

DRAIN LINES - GENERAL

The TPR valve and ECV should both have drain pipes connected to their outlets. These pipes should run to ground level where hot water discharge is safe, and clear of any paved areas. Do not seal or block the ends of these drain pipes or the valve outlets. Do not allow water from the valve outlets or drain pipes to drip or discharge onto roofing materials or roof gutters.

VALVE LOCATION

All the valves in the inlet line must be located at least 1 metre away from the heater and within easy reach, no more than 1.8 metres above ground level. The valves should not be located on the house roof and NOT IN THE CEILING SPACE.

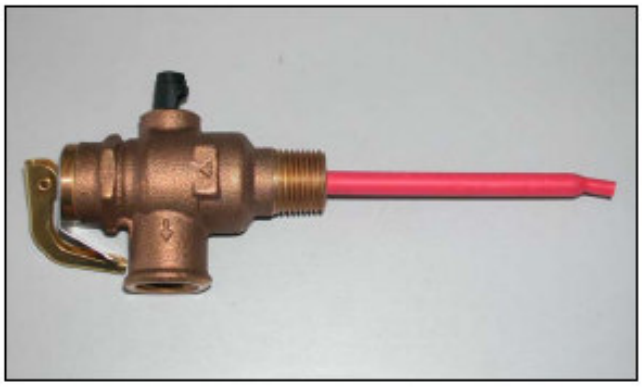
WATER PRESSURE

Where the supply water pressure frequently exceeds 850 kPa, an additional pressure-limiting valve will be necessary to limit the incoming mains pressure to 600 kPa. In cases where a pressure-limiting valve is not fitted, the occurence of any pressure in excess of 600 kPa under any circumstances will automatically invalidate the Warranty given by Solahart.

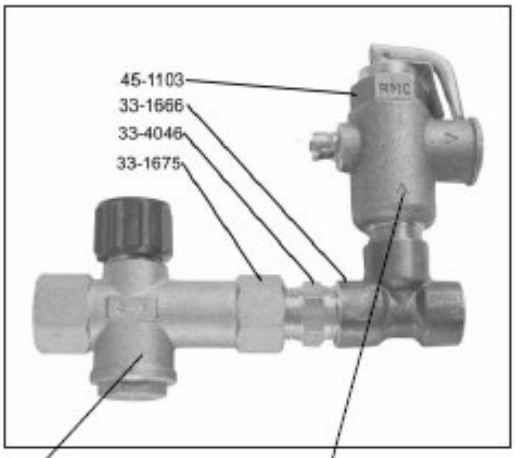
SUPPLEMENTARY ENERGY SUPPLIES

The standard TPR valve that is fitted to the tank is rated at 10 kW. Supplementary energy supplies giving a combined total heat input in excess of 10 kW including the electric booster should not be fitted to the heater unless the TPR valve is replaced with another of a larger capacity.

TPR VALVE (45-1104)



Typical Cold Water Inlet Configuration



TRIO Valve (33-1675)
Non Return & Isolating
Valve with Strainer

H50 Cold Relief
Valve (45-1103)

FROST / FREEZE PROTECTION

Open Circuit Thermosyphon (L) systems are not suitable for locations that are prone to freeze conditions or where the air temperature can fall below 5°C (41°F). In areas that are prone to frost / freezing, it is recommended that a Closed Circuit Thermosyphon (J or Kf) system be used.

The concentration of the Propylene Glycol solution (Heat Transfer Fluid) in the closed circuit should be determined by the minimum temperature that the system will be exposed to.

Freezing Point of Propylene Glycol (Hartgard) Solution

20% Propylene Glycol by volume	-7°C	18°F
30% Propylene Glycol by volume	-13°C	7°F
40% Propylene Glycol by volume	-22°C	-8°F
50% Propylene Glycol by volume	-34°C	-29°F

Solahart recommends using a 1 complete bottle of Hartgard in each system or a minimum concentration of 20% as this will cover most applications. If the system is to be installed in an area where the temperature falls below -34°C (-29°F), please contact your dealer for advice.

EXTERNAL PIPE INSULATION

Where potable water piping is in an external location or attic space where the temperature can be as low as -7°C (18°F), it must be insulated with a minimum ¾" Armaflex (or similar) flexible elastomeric closed cell thermal insulation. Where the temperature can fall to -11°C (12°F), the insulation thickness must be increased to 1 ½".

Insulation in external locations can deteriorate through UV radiation. To prevent this, a layer of outdoor UV stable paint or other similar protective coating must be applied to the insulation.

STOVE COIL BOOSTERS

Manually fed boosters such as stove coils, back boilers or coils in open fired grates are not permitted to be connected to Solahart heaters unless the storage cylinder is open vented. Such auxiliary energy sources must not be connected into the closed circuit. Installation details for these devices are available from Solahart on application. In Australia, refer to AS3500.1 for additional information. Refer also to your local water authority requirements for details of vent design, header tank and reduction valves.

ELECTRICAL ELEMENT BOOSTING

Some systems are supplied with an auxiliary electrical booster element which can be used as a boosting heater or as an emergency heater. If the element is present as an emergency heater it should only be used as an emergency heater.

IN-SERIES GAS BOOSTING

Refer to the installation manual provided with the kit.

INSTALLATIONS IN CYCLONE OR HURRICANE AREAS

In areas susceptible to cyclones, hurricanes or very high winds, a separate set of instructions and a modified mounting kit is available from Solahart. This kit is suitable for 'with-pitch' installations only.

PACKING, STORAGE & TRANSPORTATION

All Thermosyphon products are to be kept in the original packaging materials and should be stored or transported in the vertical position - note there is an arrow to indicate the 'UP' direction for Tanks.

SYSTEM DECOMMISSIONING

At the end of the product lifetime, decommissioning of the system should be undertaken by an installer or suitable qualified plumber and / or electrician (if required). All materials used in this product can be passed to your local material recycling centre for disposal - refer to local council regulations for details.

INSTALLERS CHECKLIST

- ☐ Ensure that the system is installed as directed in this manual
- ☐ Check that all mechanical fixings are secured
- ☐ Check that all pipe connections are correctly tightened
- ☐ Ensure potable water is connected and switched on
- ☐ Check that the potable water tank is filled
- ☐ For Closed Circuit systems ensure the closed circuit has been commissioned correctly and is filled with the correct concentration of Heat Transfer Fluid solution
- ☐ Ensure that electrical power is switched on (if required)
- ☐ Ensure the Collector covers are removed
- ☐ Ensure that any pipe connections through the roof have been sealed correctly
- ☐ Ensure the system is installed with the correct TILT (hot pipe side higher)
- ☐ In case of a remote installation make sure that a minimum of ¾" or 22mm pipe is used and that the piping has a continuous upwards slope towards the tank.

NOTICE TO VICTORIAN CUSTOMERS

The Victorian Plumbing Industry Commission advises that this appliance must be installed by a licensed person as required by the Victorian Building Act 1993.

Only a licensed person will give you a Compliance Certificate, showing that the work complies with all the relevant standards. Only a licensed person will have insurance protecting their workmanship for 6 years. Make sure you use a licensed person to install this water heater and ask for your Compliance Certificate.

INSTALLATION INSTRUCTIONS - CLOSED CIRCUIT SERIES

THE TANKS AND COLLECTORS ARE HEAVY. IMPROPER LIFTING TECHNIQUES COULD RESULT IN PERSONAL INJURY DURING INSTALLATION. IT IS THE INSTALLER'S RESPONSIBILITY TO USE ONLY APPROVED LIFTING AND SAFETY DEVICES AND TECHNIQUES WHEN LIFTING COLLECTORS AND TANKS ON ROOFS.

Select the location of the storage tank. The front mounting foot of the tank should be positioned directly over a tile batten. Remove several tiles to expose the rafters and this batten.

Measure 2050 mm down (1270 mm for 301 & 221 Closed Circuit System) from the centre of the batten to determine the location of the collector rail. (refer to drawings, Page 35) Mark this location. Remove several roofing tiles from this location to expose the rafters. Hook the two stainless steel straps (Part No. 33-0847, three for the 303 Closed Circuit System) to the rail and line up the straps with the rafters. Ensure that they are no more than 1.6 m apart and not closer than 1 m.

After positioning the rail level, raise the left hand side 12 mm for each collector fitted (ie 12 mm for a single collector system, 24 mm for a two collector system, 36 mm for a three collectors etc) and fix the straps to the rafters. Replace the tiles (refer to drawings, Page 35).

Move back up to where the storage tank is to be positioned. Place the aluminium flashing over this row of tiles and tuck the top of the flashing under the row above.

Now using a lifting device, lift the collectors onto the roof and place them carefully into the collector rail. Remove the red transit plugs from the collector sockets.

Join the collectors together using the collector connector assemblies (Part No. 33-7121). On systems that use conetite fittings, ensure the fittings are fully inserted into the sockets before tightening the nuts. Only medium spanner pressure will be required.

The conetite fittings should be used only once. If for any reason, assemblies with conetite fittings need to be removed, replace them completely with new assemblies.

Fit the fill assembly (Part No. 33-7134) and the collector bung assembly (Part No. 33-7135) into the bottom left and top right hand corners (respectively) of the left and right hand collectors (respectively) using medium spanner pressure. Centralise the collectors on the rail, and lock the collectors to the rail with the 4 collector clamps and tighten, using the nuts and bolts provided.

For roof installations, slide the tank-to-collector spacers (Part No. 33-7144) over the top of the collectors. These should be located 200 mm from the outer edge of the collectors, and on a high spot of the tiles (or profile for metal roofs).

Now using a lifting device, lift the tank onto the roof. Place the tank onto an aluminium flashing, **and locate the tank central to the collectors** before sliding it down onto the spacers.

Secure the tank to the roof rafters in a similar manner to that for the collectors, using the tank straps (Part No. 33-0845) and the aluminium clamps (Part No. 33-0847). Loosely attach the tank clamps to the rear foot of the tank base, and clip in and bolt the tank straps as per drawings, Page 35. Ensure the bolt heads fit into the valley of the tile.

Remove the yellow instruction label from the cold pipe. Fit the cold pipe first at the right hand side of the tank and insert the other end of the pipe to the lower collector socket and tighten.

Remove the yellow instruction label from the hot pipe. Fit the hot pipe first at the left hand side of the tank. Tighten collector-side nut, before tightening tank-side nut. The floating conetite should always be on the tank-side.

Note that neither the hot nor the cold pipes (collector return and flow lines) require insulation on these systems. It is recommended however insulation be fitted to these should the system be installed on a metal or trafficable roof.

When in position, secure the tank straps to the roof rafters as for the collector strap. Ensure the straps are tight. Replace the roof tiles. Fit the Pressure/Temperature Operated Relief Valve (Part No. 45-1104) into the tank as per water connection diagrams, Page 34.

If the installation involves the Hartstat System this should now be fitted. Refer to the installation instructions provided with the Hartstat Kit for details.

FIBRO CEMENT OR METAL SHEET ROOFING

Select a location for the storage tank, close to a purlin. Avoid locating tank at mid-span of sheeting. Fixing and assembly procedures are similar to that detailed for tiled roofs, with the exception that the tank straps and the collector straps are fixed with coach screws to the purlins below (refer to drawings, Page 35).

METAL TILED ROOF

Select a location for the storage tank. The front mounting foot of the tank should be positioned directly over a tile batten. Fixing and assembly procedures are similar to that detailed for tiled roofs, except that the tank and collector straps are fixed with spring head galvanised nails directly through the metal tiles into the rafters below. Seal under the straps with a weatherproof mastic sealer.

INSTALLATIONS USING STANDS

Refer to installation sheet in the stand kit.

SPECIAL CONSIDERATIONS FOR COLD CLIMATES

In areas where air temperatures fall below -15ºC at any time or where snow will remain on the ground for more than 24 hours continuously, refer to Solahart for specific recommendations on suitability of location.

In areas subject to heavy snowfalls, care should be taken that snow cannot build up behind the tank and that the brackets installed are capable of withstanding the expected snow loading. In these cases install the tank as close as possible to the roof ridge.

In areas where temperatures may fall below 0ºC special care must be taken to ensure that exposed lengths of the hot and cold pipes and the inlet and outlet pipes of the solar hot water heater are insulated and moisture proofed. Ensure that pipes and valves are located away from freeze locations wherever possible. Note that freezing of the valves can permanently damage the valves. Take particular care at roof penetrations.

Install the TRIO Valve and Cold Relief Valve indoors (eg. in the laundry) or in other locations not subject to freezing, but NOT in the ceiling space. If these valves are located external to the building they must be insulated with at least 19 mm of fibreglass or foam insulation, and sealed to prevent entry of moisture. A satisfactory location in frost areas is on an external wall high under the eaves.

In locations frequently subject to atmospheric temperature below -10ºC, hot and cold pipes and valves may freeze even when insulated. It is recommended that in these locations, the cold pipes and valves to the Solahart storage tank and the hot pipe from the tank should have electric heater tape under the insulation. The electric heater tape should have a heat output of between 10 and 20 W/m. The tape should be a self-limiting tape such as "Raychem" and should be controlled by a thermostat set at 0ºC. Connect the heater tape to a normally ON power supply.

FILLING AND COMMISSIONING OF THE STORAGE TANK

Do not turn on the electric power or gas until the tank has been filled with water. Turn on at least one hot water outlet tap - preferably over a bath or laundry basin. Open the mains water supply tap on the line to the water heater and allow the water to fill the storage cylinder dispelling air out of the top of the cylinder through the open tap. As soon as water flows freely (without air bursts) from the tap, close the tap and allow the cylinder to pressurise. Check all joints for water tightness.

Turn on the electric power or gas to the booster element ensuring that the power or gas is correctly connected i.e. 'Active' line to 'Active' terminal etc.

Operate both pressure relief valves easing gear to ensure that the valves are functional. The storage tank is now filled and ready to operate as an electric or gas water heater. To operate as a solar water heater, the closed circuit must be commissioned by an authorised Solahart installer or service contractor.

FILLING AND COMMISSIONING THE CLOSED CIRCUIT

The solar collectors and tank heat exchanger jacket are connected together to create a sealed, closed circuit that is entirely separate from the potable water in the storage cylinder. The circuit is filled with 'Hartgard' fluid. Under no circumstances can any fluids other than 'Hartgard' be used as the heat transfer fluid.

Only Solahart trained and authorised installers are permitted to fill the closed fluid circuit. Refer to your Solahart dealer for more information. For authorised installers, a special set of instructions and installation tools are provided.

Only potable water can be used in conjunction with 'Hartgard'. Refer to the section on water quality on Page 6 of this manual.

THE STORAGE TANK MUST BE FILLED WITH WATER BEFORE FILLING THE CLOSED CIRCUIT.

Instructions detailing the closed circuit commissioning process are provided on the following two pages.

PRECAUTIONS WITH HARTGARD – RAINWATER TANKS

While Hartgard is non toxic to humans, it does have an adverse effect on water stored in rainwater tanks. Hartgard will kill microscopic algae that is typically present in rainwater tanks. This may then render the rainwater foul and unfit for human consumption. Solahart recommends that installers ensure that rainwater tanks cannot be contaminated with Hartgard solution. Before installing a closed circuit system, the installer should determine whether the run-off from the roof on which the system will be mounted, is collected in a rainwater tank.

If this is the case, then the section of gutter immediately beneath the proposed location of the new Solahart system should be isolated from the rainwater collection system. This can be done by blocking that section of gutter from the remaining gutter, and fitting a separate down pipe to take any run-off water from that section of roof away to waste. If this is not practical for a specific installation, then the installer should discuss the possible options with the home owner.

This should be done prior to installing the new system, so that any leak or spillage during installation does not make its way into the rainwater tank.

If a rainwater tank does become contaminated, then the following actions are necessary to return the water supply to a consumable state.

a. Correct the leak or spillage.
b. Wash down the roof area where the spill or leak has occurred.
c. Flush out the gutters and down pipes.
d. Empty the rainwater tank, and clean out all algae from the inside of the tank.
e. Refill the rainwater tank with fresh water.

CLOSED CIRCUIT COMMISSIONING PROCEDURE – GENERAL

Remove the Fill Plug from the Collector Fill Assembly.
Remove PR6/PR200 Valve from the Tank.
Connect a ½" hose to the Collector Fill Assembly and fill the Closed Circuit with water.
(Hose to be supplied by Installer).

1

Continue filling until water overflows from the Jacket Relief Valve Port and there are no air bubbles in the overflowing water.

2

Fit the Test Block into the Jacket Relief Valve Port.

3

Fit the PR6/PR200 Valve to the Test Block.

4

Remove the hose from the Collector Fill Assembly and replace the Fill Plug as quickly as possible to minimise fluid spillage.

5

CAUTION: If more than 0.5 litres of fluid is spilled, repeat steps 1-5

When charging the system using a PR200 Valve, pressurise the system until the PR200 Valve opens or until a pressure of 170kPa is read on the pressure gauge, whichever happens first.

When charging the system using a PR6 Valve, pressurise the system until the PR6 Valve opens or until a pressure of 80kPa is read on the pressure gauge, whichever happens first.

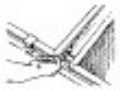
Connect a bicycle pump/portable compressor to the Test Block and pressurise the Closed Circuit to 80kPa/170kPa, as appropriate.
Remove bicycle pump/portable compressor from Test Block.

6

WARNING:
Do not allow the Closed Circuit pressure to rise above 200kPa or permanent system damage may occur.

If the PR6/PR200 Valve opens during the pressure test, wait until the Valve re-seals before checking all connections for evidence of leakage.
If the Valve does not open during the pressure test then check all connections for any evidence of leakage.

7



Ensure that the Closed Circuit pressure remains stable for at least 10 minutes.

8

If any leakage is observed at any of the connections, rectify the problem and repeat steps 1 to 8.

9

Release the pressure from the Closed Circuit by removing the PR6/PR200 Valve from the Test Block.
Once the pressure is relieved, replace PR6/PR200 Valve.

10

Remove the Fill Plug from the Fill Assembly and connect the ½" hose as quickly as possible to minimise fluid spillage.

11

CAUTION: If more than 0.5 litres of fluid is spilled, repeat steps 1-5

Remove the PR6/PR200 Valve and siphon the entire contents of the Hartgard container into the Closed Circuit using the ½" hose.

12

Water will flow from the PR6/PR200 Valve Port during this operation (4.5 litres for each container of Hartgard).

13

When the Hartgard container is empty, flush approx 1 litre of clean water through the hose into the Collector (to ensure all of the Hartgard has been siphoned into the system), and refit the PR6/PR200 Valve to the Test Block.

14

Remove the hose from the Fill Assembly and screw in the Fill Plug as quickly as possible to minimise fluid spillage.

15

CAUTION: If more than 0.5 litres of fluid is spilled, repeat steps 1-5

When charging the system using a PR200 Valve, pressurise the system until the PR200 Valve opens or until a pressure of 170kPa is read on the pressure gauge, whichever happens first.
When charging the system using a PR6 Valve, pressurise the system until the PR6 Valve opens or until a pressure of 80kPa is read on the pressure gauge, whichever happens first.

Pressurise the Closed Circuit to 80kPa/170kPa, as appropriate, using the bicycle pump/portable compressor and ensure there is no leak at the Fill Assembly. Remove bicycle pump/portable compressor from Test Block.

16

Ensure that the pressure remains stable for at least 10 minutes.

17

Release the pressure from the Closed Circuit by removing the PR6/PR200 Valve from the Test Block.

18

Remove the Test Block from the Tank.

19

Fit the PR6/PR200 Valve to the Jacket Relief Valve Port when ready or as soon as water starts to be expelled (440 systems).

20

The closed circuit system is now ready for operation.

Pages from 16 to 17 not regarding the installed models

TECHNICAL SPECIFICATIONS

Systems		151L & 151L FREE HEAT	151J	151KF	181L & 181L FREE HEAT	181J & 181J FREE HEAT	181KF & 181KF FREE HEAT	182L & 182L FREE HEAT	182J & 182J FREE HEAT	182KF & 182KF FREE HEAT
Delivery	litres	130	130	130	160	160	160	160	160	160
(solar)	US gal.	34	34	34	42	42	42	42	42	42
Delivery	litres	128	128	128	153	153	153	153	153	153
(aux. boost)	US gal.	34	34	34	40.6	40.6	40.6	40.6	40.6	40.6
Weight	kg	239	256	256	275	292	292	311	337	338
(full)	lbs	527	564	564	606	644	644	685	743	745
Weight	kg	86	102	102	92	108	108	125	153	154
(empty)	lbs	190	225	225	203	238	238	278	337	339
Length	m	2.475	2.475	2.475	2.475	2.475	2.475	2.475	2.475	2.475
	in	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5
Height	m	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
	in	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Width	m	1.29	1.29	1.29	1.485	1.485	1.485	2.31	2.31	2.31
	in	50.1	50.1	50.1	58.5	58.5	58.5	90.9	90.9	90.9
Working	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
Pressure	psi	145	145	145	145	145	145	145	145	145
Test	kPa	2100	2100	2100	2100	2100	2100	2100	2100	2100
Pressure	psi	305	305	305	305	305	305	305	305	305
Tank type		150L or 150LF	150J	150J	180L or 180LF	180J or 180F	180J or 180F	180L or 180LF	180J or 180F	180J or 180F
Type of Collector		L	J	KF	L	J	KF	L	J	KF
Number of Collectors		1	1	1	1	1	1	2	2	2

Systems		221L & 221L FREE HEAT	221J & 221J FREE HEAT	221KF & 221 KF FREE HEAT	301L & 301L FREE HEAT	301J & 301J FREE HEAT	301KF & 301KF FREE HEAT	302L & 302L FREE HEAT	302J & 302J FREE HEAT	302KF & 302KF FREE HEAT
Delivery	litres	200	200	200	260	260	260	260	260	260
(solar)	US gal.	52	52	52	68	68	68	68	68	68
Delivery	litres	184	184	184	248	248	248	248	248	248
(aux. boost)	US gal.	48.6	48.6	48.6	65	65	65	65	65	65
Weight	kg	324	347	347	421	448	448	457	495	495
(full)	lbs	714	765	765	928	987	987	1007	1091	1091
Weight	kg	101	123	123	118	144	144	151	186	186
(empty)	lbs	223	271	271	260	317	317	333	410	410
Length	m	2.475	2.475	2.475	2.475	2.475	2.475	2.475	2.475	2.475
	in	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5
Height	m	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
	in	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Width	m	1.76	1.76	1.76	2.31	2.31	2.31	2.31	2.31	2.31
	in	69.3	69.3	69.3	90.9	90.9	90.9	90.9	90.9	90.9
Working	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
Pressure	psi	145	145	145	145	145	145	145	145	145
Test	kPa	2100	2100	2100	2100	2100	2100	2100	2100	2100
Pressure	psi	305	305	305	305	305	305	305	305	305
Tank type		220L or 220LF	220J or 220F	220J or 220F	300L or 300LF	300J or 300F	300J or 300F	300L or 300LF	300J or 300F	300J or 300F
Type of Collector		L	J	KF	L	J	KF	L	J	KF
Number of Collectors		1	1	1	1	1	1	2	2	2

Systems		303L & 303L FREE HEAT	303J & 303J FREE HEAT	303KF & 303KF FREE HEAT	443L & 443L FREE HEAT	443J & 443J FREE HEAT	443KF & 443KF FREE HEAT	444L & 444L FREE HEAT	444J & 444J FREE HEAT	444KF & 444KF FREE HEAT
Delivery	litres	260	260	260	400	400	400	400	400	400
(solar)	US gal.	68	68	68	105	105	105	105	105	105
Delivery	litres	248	246	246	359	320	320	320	320	320
(aux. boost)	US gal.	65	65	65	94.9	84.5	84.5	84.5	84.5	84.5
Weight	kg	493	540	552	676	730	730	712	775	788
(full)	lbs	1087	1190	1217	1490	1609	1609	1569	1708	1737
Weight	kg	184	228	229	250	289	289	280	319	332
(empty)	lbs	406	503	505	551	637	637	573	703	732
Length	m	2.475	2.475	2.475	2.475	2.475	2.475	2.475	2.475	2.475
	in	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5	97.5
Height	m	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
	in	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
Width	m	3.16	3.16	3.16	3.34	3.34	3.34	4.35	4.35	4.35
	in	124.4	124.4	124.4	131.5	131.5	131.5	171.8	171.8	171.8
Working	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
Pressure	psi	145	145	145	145	145	145	145	145	145
Test	kPa	2100	2100	2100	2100	2100	2100	2100	2100	2100
Pressure	psi	305	305	305	305	305	305	305	305	305
Tank type		300L or 300LF	300J or 300F	300J or 300F	440L or 440LF	440J or 440F	440J or 440F	440L or 440LF	440J or 440F	440J or 440F
Type of Collector		L	J	KF	L	J	KF	L	J	KF
Number of Collectors		3	3	3	3	3	3	4	4	4

Notes: Solar Delivery: typical draw from field tests, methodology analogous to AS1056.1
Aux. Boost Delivery measured as prescribed by AS1056.1 Appendix C.

TECHNICAL SPECIFICATIONS (cont)

Tanks		150L & 150LF	150J	180L & 180LF	180J	180F	220L & 220LF	220J	220F	300L & 300LF	300J	300F
Capacity	litres	150	150	180	180	180	220	220	220	300	300	300
	US gal.	40	40	48	48	48	58	58	58	80	80	80
Weight	kg	199	208	235	245	246	284	297	298	381	398	399
(full)	lbs	439	454	518	540	542	626	655	657	840	877	879
Weight	kg	49	56	55	65	66	64	77	78	81	98	99
(empty)	lbs	108	123	121	143	145	141	170	172	179	216	218
Length	m	1.28	1.28	1.494	1.494	1.494	1.76	1.76	1.76	2.31	2.31	2.31
	in	50.4	50.4	58.8	58.8	58.8	69.3	69.3	69.3	91	91	91
Height &	m	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
width	in	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1

Tanks		440L & 440LF	440J	440F
Capacity	litres	440	440	440
	US gal.	116	116	116
Weight	kg	564	587	588
(full)	lbs	1243	1294	1294
Weight	kg	124	147	148
(empty)	lbs	273	324	324
Length	m	3.285	3.285	3.285
	in	129.3	129.3	129.3
Height &	m	0.51	0.51	0.51
width	in	20.1	20.1	20.1

Cylinder material	Steel, low carbon, 2.5 mm (0.1")
Cylinder lining	Primaglaze: ceramic vitreous enamel, 2 coats
Insulation	Polyurethane: pressure injected foam, zero CFC
Case	Aluminium: marine grade, 0.4 mm (0.2")
End caps	Polypropylene: carbon black, UV stabilised
Anode	Magnesium, sacrificial, with steel core

Auxiliary Electric Booster	Natural Wonder Gas Booster
Type: Copper sheath, immersion	Type: Fan forced
Rating (kW):1.8, 2.4, 3.0, 3.6, 4.8	Rating: 13MJ/h
Supply Voltage: 220V - 250V	Supply Voltage: 220V - 250V

Collectors		L	J	KF
Aperture	m^2	1.87	1.87	1.87
	ft^2	20	20	20
Capacity	litres	3	3.5	3.5
	US gal.	0.8	0.9	0.9
Weight	kg	36	46	46
(full	lbs	79	101	101
Weight	kg	33	42	42
(empty)	lbs	73	93	93
Length	m	1.937	1.937	1.937
	in	76.6	76.6	76.6
Depth	m	0.077	0.077	0.077
	in	3	3	3
Width	m	1.022	1.022	1.022
	in	40.24	40.24	40.24
Working	kPa	850	80	80
pressure	psi	85	12	12
Test	kPa	150	450	450
pressure	psi	22	64	64
No of risers		6	35	35
Riser material		Copper	Steel	Steel
Absorber material		Aluminium	Steel	Steel
Absorber surface		P*	P*	C*

Tray:	Aluminium: 0.6 mm
Insulation:	Polyester: 55mm - L and J
	Glasswool: 55mm - KF
Glass:	Tempered Low Iron, 3.2mm thick

P* = Polyester powder coat
C* = Chromonyx selective surface

ANNUAL PERFORMANCE CALCULATIONS FOR EUROPE

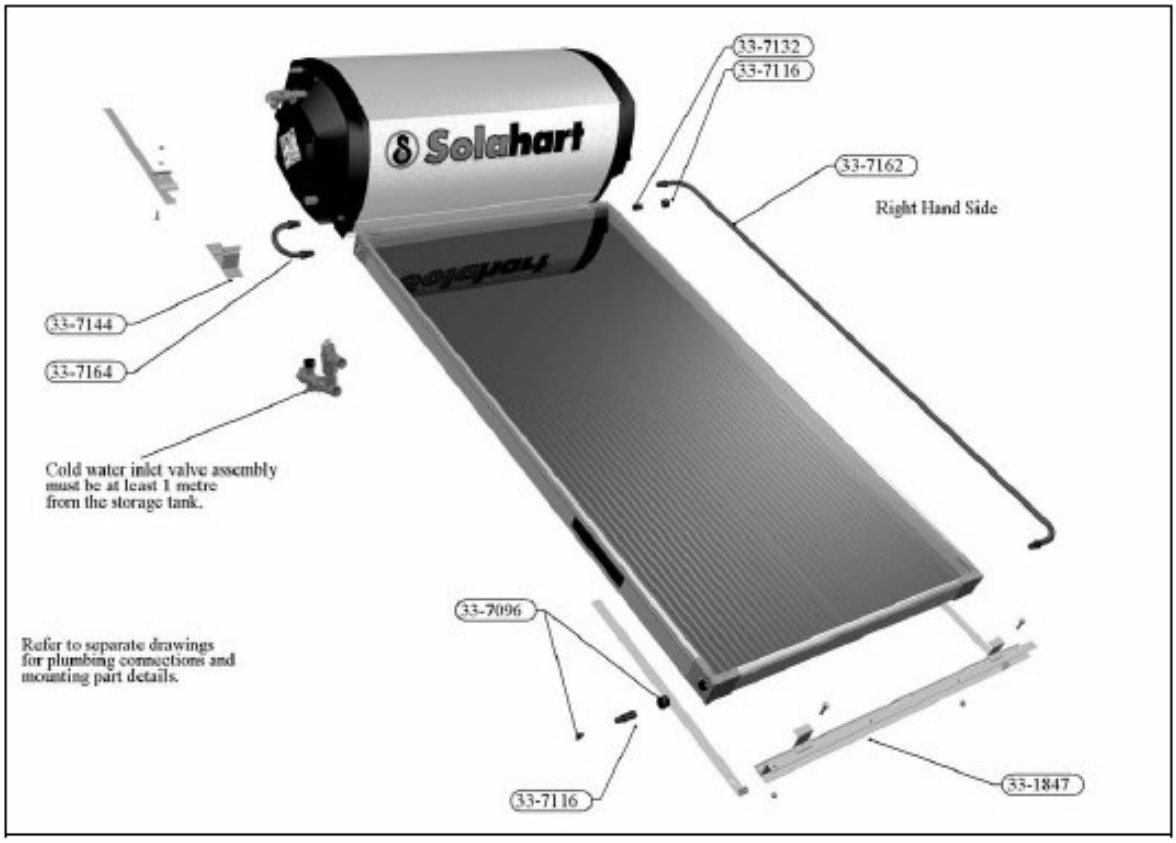
Annual performance calculation of Solahart thermosyphon systems according EN12976 SolarKeyMark Systems, ITW Test Report No 04SYS30 for the 302Kf system and INETI Test Report No 10/101.104/2005 for the 302J system.

Qd = energy demand
QL = solar energy (load)
f-sol = solar fraction

Demand	200 litres/day					250 litres/day					300 litres/day				
		302Kf	302Kf	302J	302J		302Kf	302Kf	302J	302J		302Kf	302Kf	302J	302J
Location	Qd	QL	f-sol	QL	f-sol	Qd	QL	f-sol	QL	f-sol	Qd	QL	f-sol	QL	f-sol
Latitude	MJ	MJ	%	MJ	%	MJ	MJ	%	MJ	%	MJ	MJ	%	MJ	%
Stockholm 69.6 N	11164	5582	50	3671.9	32.9	13939	6307	45.3	4453	32	16746	6812	40.7	4934.8	29.5
Wurzburg 49.5 N	10628	5929	55.8	3162	29.6	13277	6843	51.5	3865.4	28.9	15926	7506	47.1	4281.5	26.7
Davos 46.8 N	12110	8767	72.4	5507.9	45.5	15137	9871	65.2	6723.3	44.5	18165	10565	58.2	7460.6	41.4
Athens 38.0 N	8326	6118	73.5	4427.5	53.3	10407	7159	68.8	5442.2	52.4	12488	7979	63.9	6175.8	49.5

INSTALLATION DIAGRAM

MODELS 151J & 151KF



For general (for ALL models) Installation Instructions, refer to Page 8.

For Installation Instructions on Closed Circuit models, refer to Page 12.

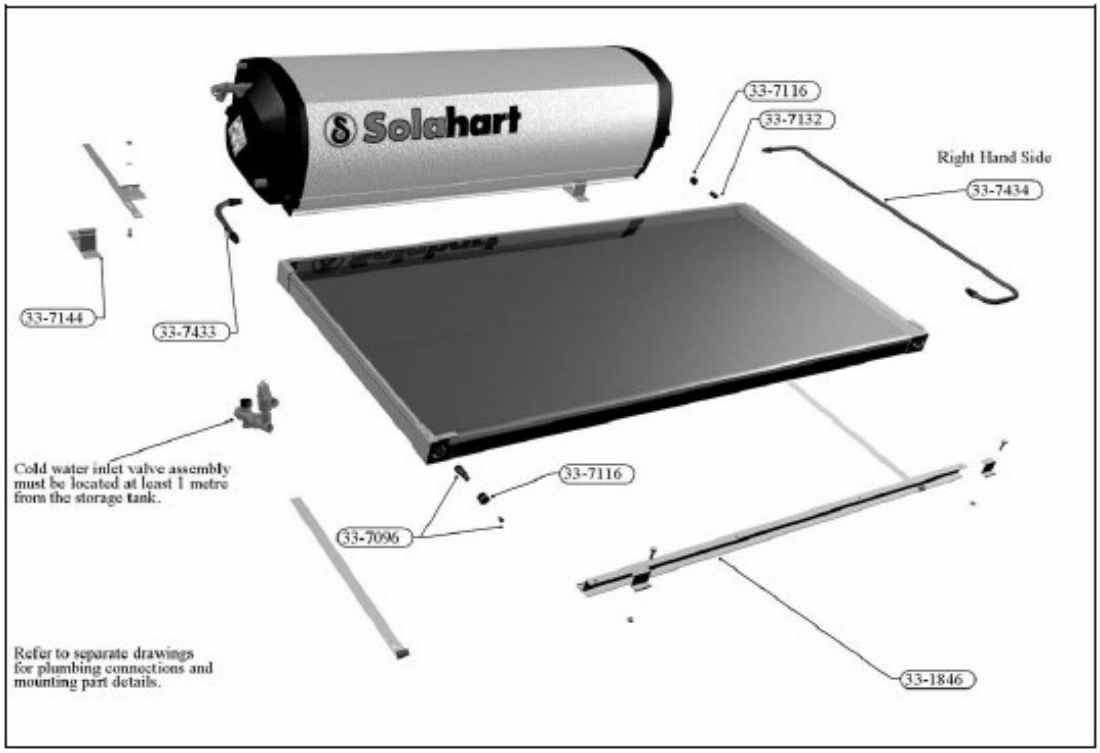
For Water Connection details, refer to Page 34.

For Tank and Collector fixing details, refer to Page 35.

Pages from 21 to 24 not regarding the installed models

INSTALLATION DIAGRAM

MODELS 221J & 221KF



For general (for ALL models) Installation Instructions, refer to Page 8.

For Installation Instructions on Closed Circuit models, refer to Page 12.

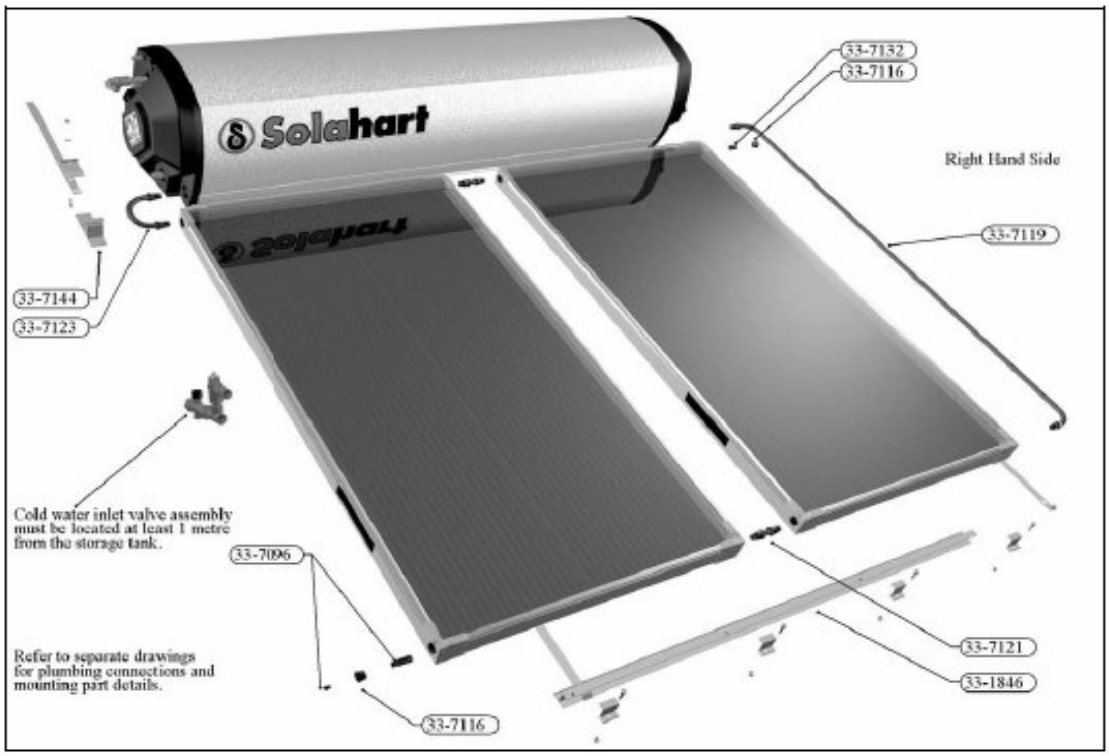
For Water Connection details, refer to Page 34.

For Tank and Collector fixing details, refer to Page 35.

Pages from 21 to 24 not regarding the installed models

INSTALLATION DIAGRAM

MODELS 302J, 302KF, 302J FREE HEAT & 302KF FREE HEAT



For general (for ALL models) Installation Instructions, refer to Page 8.

For Installation Instructions on Closed Circuit models, refer to Page 12.

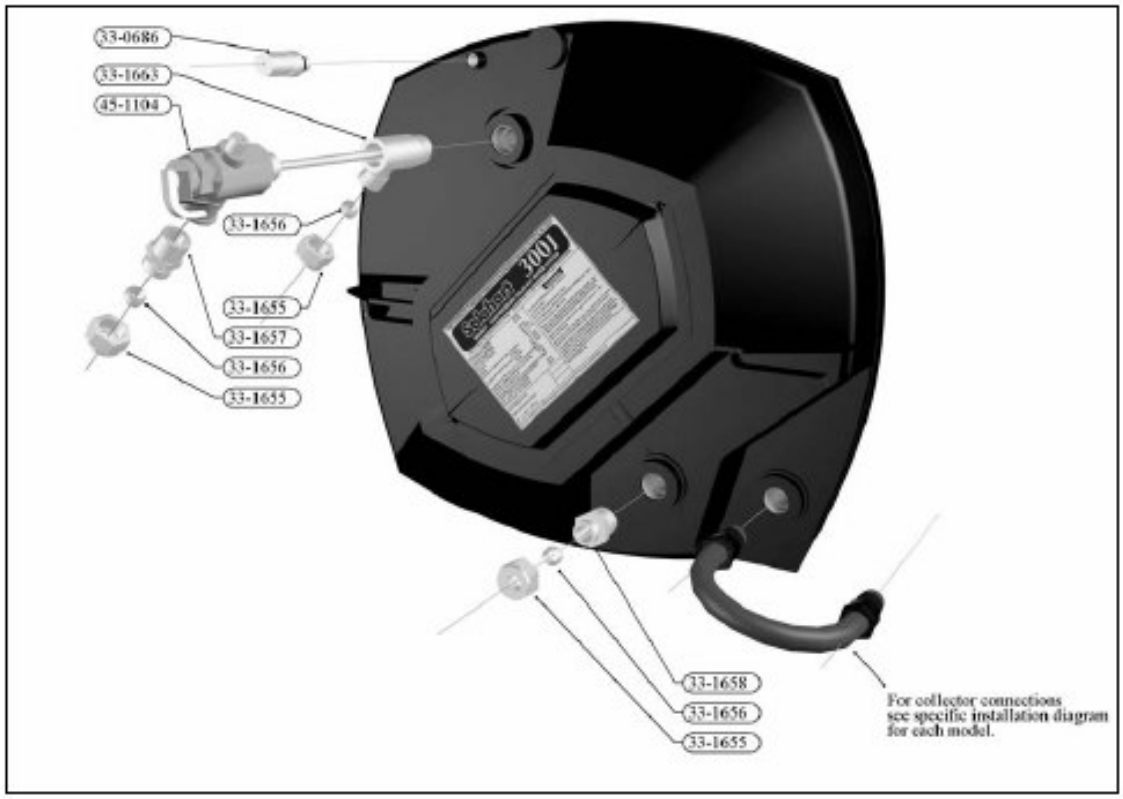
For Water Connection details, refer to Page 34.

For Tank and Collector fixing details, refer to Page 35.

Pages from 29 to 33 not regarding the installed models

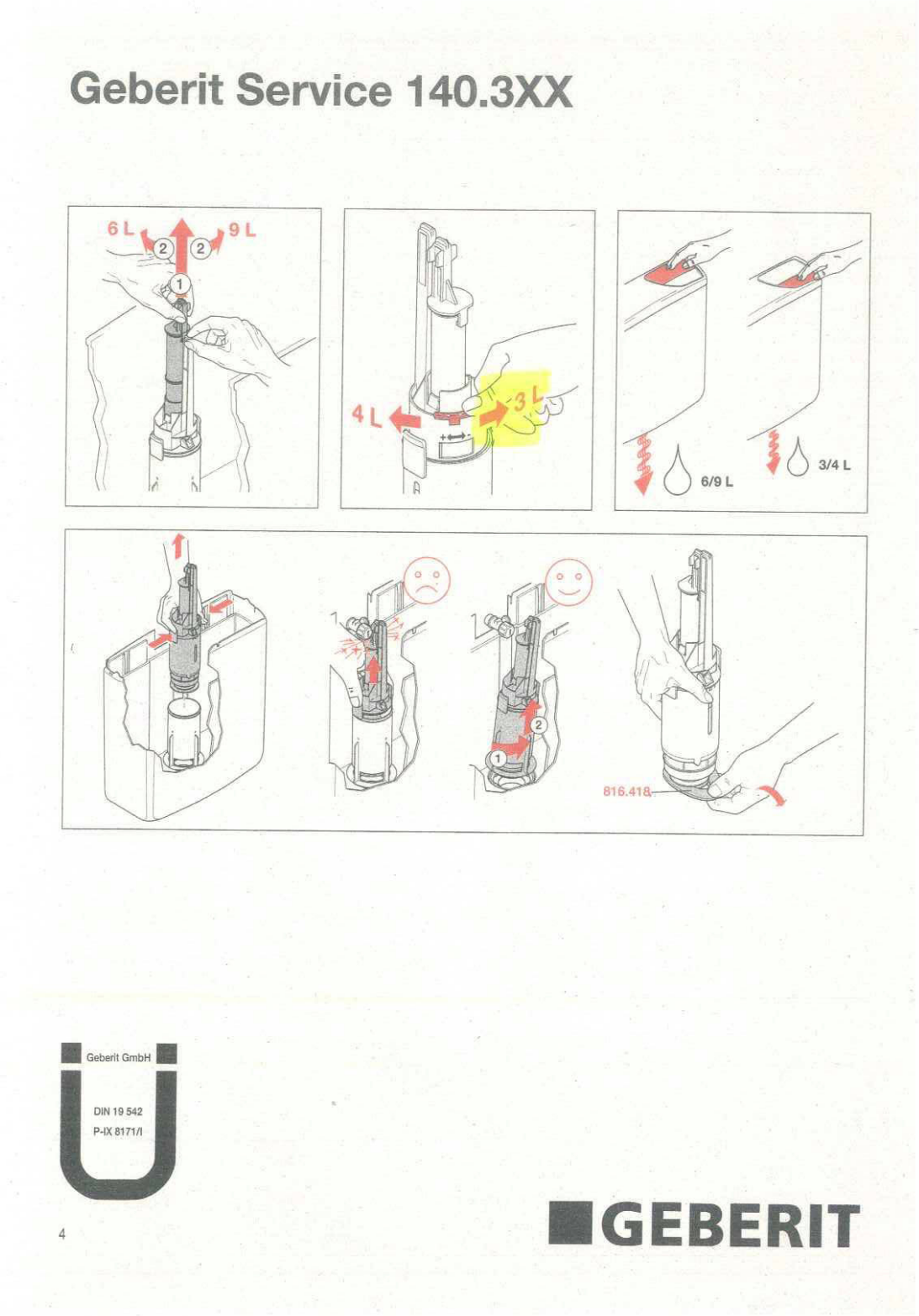
Closed Circuit Systems Water Connections

(All Potable water & drain lines are ½" BSP)



19 MAINTENANCE SCHEDULE

19.1 WC flow regulator



19.2 Tee box

techno®

Techno s.r.l. - technology & innovation - tel. +39.031.976445 - www.techno.it - info@techno.i
Via Bancora e Rimoldi, 27 - 22070 - Guanzate (co) -ITALY

IT Istruzioni per l'installazione
GB Installation Instructions
FR Instructions d'installation
DE Montage-Anweisungen
ES Instrucciones de instalación
PT Instruções de instalação
NL Instructies voor het installeren.
PL Instrukcja instalacji
CZ Montážní návod
SK Montážný návod
SI Navodila za montažo
SE Instruktioner för installationen
DK Installationsvejledning
NO Instruks for installasjon
FI Asennus ohjeet
GR ΟΔΗΓΙΕΣ ΕΓΚΑΤΑΣΤΑΣΗΣ
BG Инструкция за експлоатация
EE Paigaldusjuhend
LV Ierīkošanas instrukcija
LT Montavimo instrukcija
RO Instructiuni de instalare
HU Összeszerelési útmutató
RU Инструкция по монтажу
CN 安裝指引
AE :المتركيبات على
IS Leiðbeiningar v/uppsetningu
TR Montaj bilgisidir

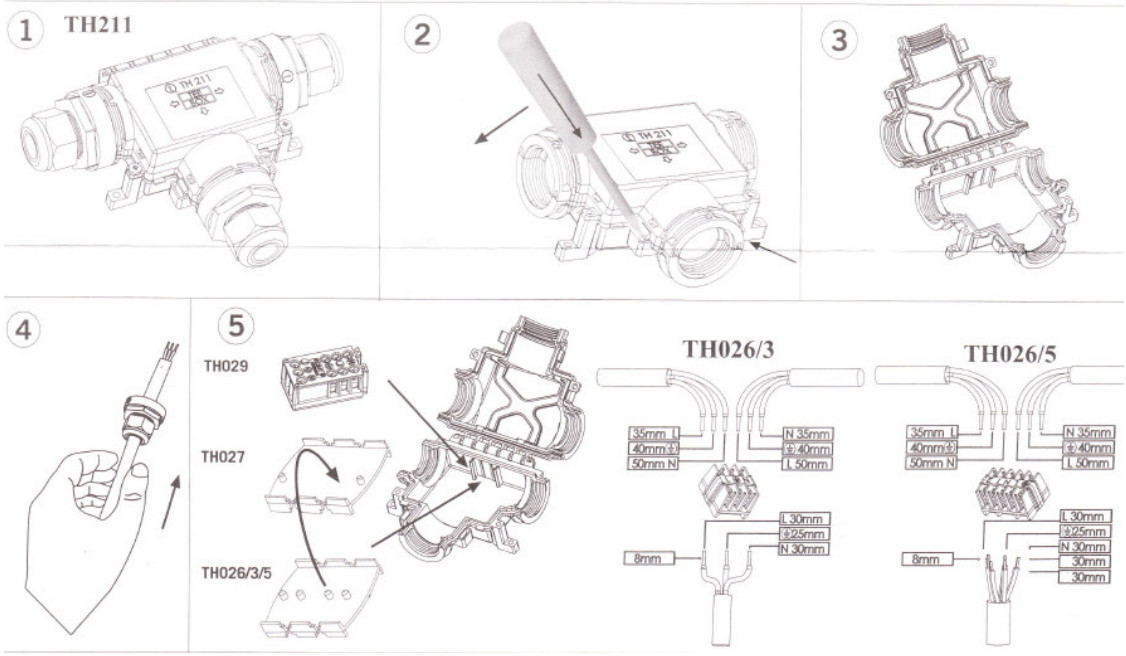
TEE BOX

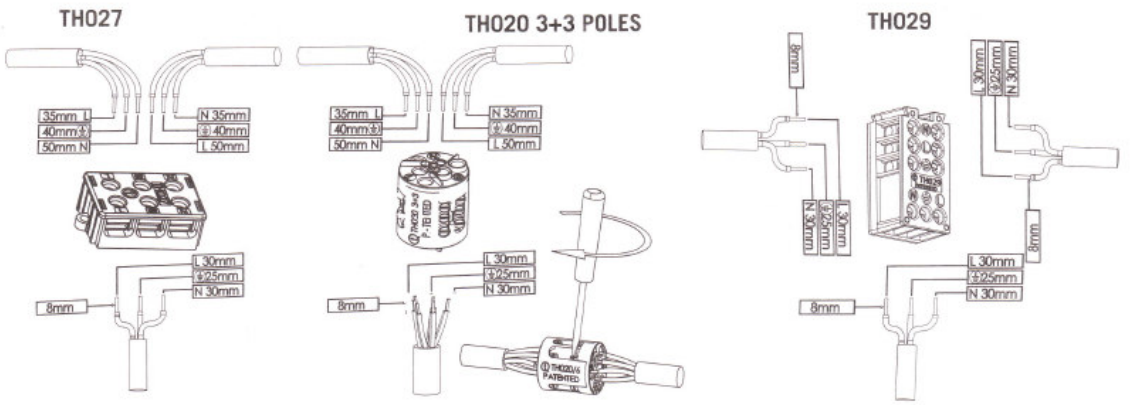
TH211
IP 54
IP 65
CE

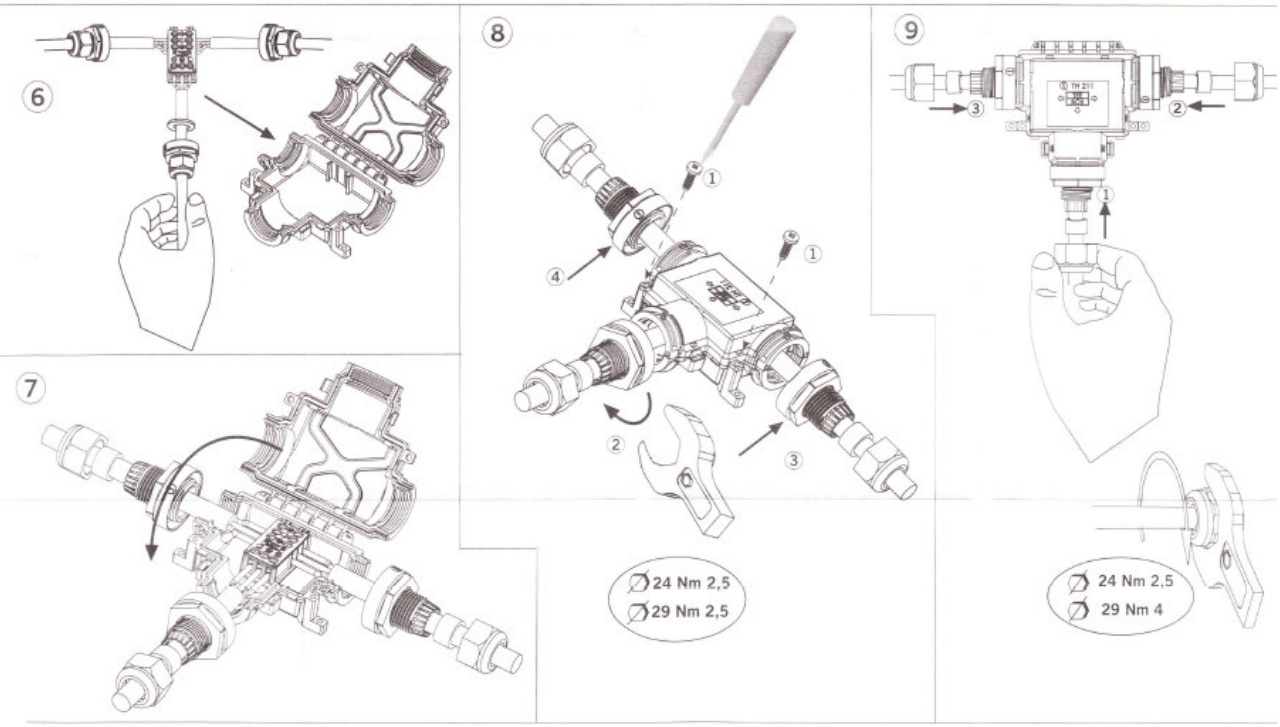
IT Togliere corrente prima di iniziare. Se in dubbio consultare un elettricista qualificato.
GB Isolate Mains Power supply before commencing. If in doubt, consult qualified electrician
FR Couper l'alimentation principale avant de commencer. En cas de doute, consulter un electricien qualifié
DE Vor Inbetriebnahme vom Stromnetz trennen. Wenn im Zweifel, Beratung durch einen qualifizierten Elektriker.
ES Aislar fuente de alimentación principal antes de comenzar. En caso de duda, consultar electricista cualificado
PT Cortar a alimentação de corrente antes de proceder à ligação. Em caso de dúvida consultar um técnico especialisado.
NL Zet de hoofdschakelaar van de energievoorziening uit voordat u begint. Als u hierover twijfels heeft, vraag dan hulp aan een gediplomeerde electricièn.
PL Odłączyć zasilanie przed rozpoczęciem instalacji. W przypadku wątpliwości proszę skonsultować się z wykwalifikowanym elektrykiem.
CZ Před zahájením instalace odpojte hlavní přívod elektrické energie. V případě pochybností to konzultujte s kvalifikovanou osobou (elektrikářem).
SL Pred zahájením inštalácie odpojte hlavný prívod elektrickej energie. V prípade pochybností to konzultujte s kvalifikovanou osobou (elektrikárom).
SI Pred začetkom del izklopite glavni vir napajanja. V kolikor ste v dvomih, se posvetujte s kvalificiranim električarjem.
SE Koppla bort nätspänningen innan inkoppling. Vid tveksamhet, anlita kvalificerad elektriker.
DK Afbryd strømmen før installationen påbegyndes. I tvivlstilfælde kontakt autoriseret elektriker

NO Koble fra Hovedstrømkilden før montering. Er en i tvil, kontakt kvalifisert elektrikker
FI Eristä Päävirtalähde ennen yhdistämistä. Jos epäilet, kysy ammattisähkömieheltä
GR ΚΛΕΙΣΤΕ ΤΗΝ ΠΑΡΟΧΗ ΤΟΥ ΡΕΥΜΑΤΟΣ ΠΡΙΝ ΞΕΚΙΝΗΣΕΤΕ ΑΝ ΕΧΕΤΕ ΑΜΦΙΒΟΛΙΕΣ ΣΥΜΒΟΥΛΕΥΤΕΙΤΕ ΗΛΕΚΤΡΟΛΟΓΟ
BG Прекъснете захранващото напрежение преди започване. Ако не сте сигурни, консултирайте се с квалифициран електротехник
EE Lülitage voolualikas enne alustamist välja. Kahtluste puhul konsulteerige kvlifitseeritud elektrikuga
LV Noizolēt GAlveno Spēka pievadu pirms darbu uzsākšanas.Ja neesat pārliecināti, par veicamā pareizību, konsultējaties ar profesionālu elektriķi!
LT Prieš pradėdami atjunkite maitinimo šaltinį. Jei abejojate-pasitarkite su kvalifikuotu elektriku
RO Inainte de conectarea la retea opriti curentul, daca aveti dificultati cu instalarea apelati un electrician autorizat
HU Áramtalanítsa a készüléket mielőtt hozzákezd. Ha kérdése van forduljon képzett szakemberhez
RU Перед началом монтажа стоит отключить токоподачу. В случае сомнений прошу снестись с квалифицированным электриком
CN 安裝及測試前先關掉電源. 如有疑問, 請資詢合資格電器工程師.
AE .تأكد من فصل مزود الطاقة الرئيسي قبل البدء . وإن كانت لديك اية شكوك ، يرجى الاستعانة بمختص لكهرباء أخصائي
IS EINANGRIÐ - VEIT ER EKKI HVAÐ HANN ER AÐ REYNA AÐ SEGJA HÉRNA EF EITTHVAÐ ER ÓLJÓST, HAFIÐ ÞÁ SAMBAND VIÐ RAFVIRKJA
TR ANA ENERJI KAYNAGINI BASLAMADAN ONCE IZOLE EDIN.SUPHE ANINDA LUTFEN KALIFIYE BIR ELEKTIRKCIYE DANISIN

IT Grazie per aver acquistato un prodotto "MADE IN ITALY"
GB Thank you for having purchased a "MADE IN ITALY" product
FR Merci pour avoir acheté un produit "MADE IN ITALY"
DE Vielen Dank, dass Sie ein Produkt, "MADE IN ITALY" gekauft haben
ES Gracias por comprar un producto "MADE IN ITALY"
PT Os nossos agradecimentos por preferir um produto de "MADE IN ITALY"
NL Wij danken u voor uw aankoop van een product "MADE IN ITALY"
PL Serdecznie podziękowania za zakup produktu "MADE IN ITALY"
CZ Děkujeme Vám za zakoupení "MADE IN ITALY" výrobku.
SL Ďakujeme Vám za zakúpenie "MADE IN ITALY" výrobku.
SI Zahvaljujemo se vam za nakup izdelka "MADE IN ITALY"
SE Tack för att du köpt en "MADE IN ITALY" produkt
DK Tak for Deres køb af et "MADE IN ITALY" produkt.
NO Takk for at du har kjøpt et "MADE IN ITALY" produkt.
FI Kiitos että ostitte "MADE IN ITALY" tuotteen.
GR ΕΥΧΑΡΙΣΤΟΥΜΕ ΠΟΥ ΑΓΟΡΑΣΑΤΕ ΠΡΟΪΟΝ ΚΑΤΑΣΚΕΥΑΣΜΕΝΟ "MADE IN ITALY"
BG Благодарим Ви, че закупихте "MADE IN ITALY" продукт.
EE Täname, et ostsite "MADE IN ITALY" toote.
LV Paldies, ka izvēlējāties pirkumu, kas "MADE IN ITALY"
LT Ačiū, kad įsigijote produktą pagamintą "MADE IN ITAY"
RO Va multumim ca a-ti ales produsul nostru "MADE IN ITALY"
HU Köszönjük, hogy "MADE IN ITALY" terméket választott
RU Благодарю за покупку продукта "MADE IN ITALY"
CN 多謝購買本公司"MADE IN ITALY"之產品,
AE شكرا لك على شراء منتج "MADE IN ITALY"
IS TAKK FYRIR AÐ HAFA KEYPT VÖRUR "MADE IN ITALY"
TR "MADE IN ITALY" MENSEGLI URUNU TERCIH ETTIGINIZ ICIN TESEKURLER.





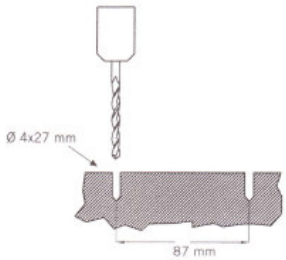


Accessori - Accessorie

600012500	Yellow Seal	$Ø_e$ 15,5	2 Fori - 2 *Holes* Ø 3,5	
600012600	Yellow Seal	$Ø_e$ 15,5	3 Fori - 3 *Holes* Ø 3,5	
600018200	Yellow Seal	$Ø_e$ 15,5	4 Fori - 4 *Holes* Ø 3,5	
600012700	Yellow Seal	$Ø_e$ 15,5	Asola - Slot Ø 11x5,5	
600013600	Yellow Seal	$Ø_e$ 15,5	1 Foro - 1 *Hole* Ø 3,5	
600013700	Yellow Seal	$Ø_e$ 15,5	Foro cieco - Blind *Hole*	
604001100	Black Seal	$Ø_e$ 15,5 - $Ø_i$ 8,5	Ø 5÷9mm	

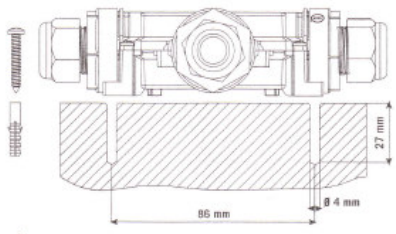
6DB000800	Double Yellow Seal	$Ø_e$ 15,5 - $Ø_i$ 8	Ø 5÷14mm
604001800	Yellow Seal	$Ø_e$ 15,5 - $Ø_i$ 12	Ø 9÷14mm

6000092CC	Nero - *Black*	Foro - *Hole* Ø 14	
6000092CE	Grigio - *Grey* 7035	CH ∅ 24mm	
6000087LF	Riduzione per dado Foro - *Hole* Ø 9	*Adapter for nut*	CH ∅ 24mm
6000156LF	Foro cieco Foro - *Hole* Ø 9	*Blind hole*	CH ∅ 24mm



601000500
Ø 2.95 x 25 mm

604000100
Ø 4 x 20 mm



For further information please refer to product data sheet on our web-site: www.techno.it

19.3 Bulb globe

EATON
CAVI E COMPONENTI ELETTRICI

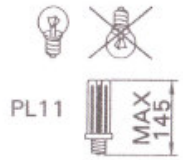
PLAFONIERA TONDA

I

Avvertenze

• Prima di procedere all'installazione, togliere la tensione di rete.
• Se la plafoniera viene installata in posizione verticale, assicurarsi che il portalampada sia rivolto verso l'alto.

• Utilizzare lampadine ad incandescenza con potenza non superiore a 60W o in alternativa lampadine a basso consumo energetico fino a PL11 di lunghezza massima 145mm.



Istruzioni per l'installazione

• Definire l'ingresso cavo utilizzando uno dei quattro fori predisposti: nel caso si usasse l'apertura posteriore posizionare il passacavo in dotazione passando i conduttori nei fori previsti; negli altri casi sfondare uno degli ingressi ed applicare passacavo o pressacavo PG9 o PG13,5.
• Inserire lo schermo riflettente nella base collocandolo nei 4 punti di riferimento.
• Fissare il portalampada nel punto di ancoraggio con la vite in dotazione.
• Fissare la plafoniera alla parete utilizzando la foratura con interasse 150 o il sistema ad aggancio (fig.1).
Idoneo anche con scatole da incasso standard a tre fori.
• Inserire la guaina isolante nei conduttori (fig.2).
• Spelare i conduttori di circa 8 mm, attorcigliare i trefoli di rame ed introdurli fino in fondo nei fori del portalampada.
• Avvitare la lampadina.
• Sistemare la guarnizione in dotazione portando ad unione le due estremità facendo in modo da portarle in prossimità di un aggancio.
• Inserire la calotta sulla guarnizione e ruotarla in senso orario.
• Per la manutenzione del prodotto aprire ruotando la calotta in senso antiorario (fig.3).

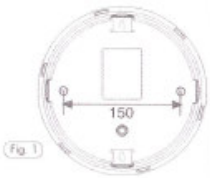


Fig. 1

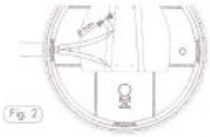


Fig. 2

Fig. 3

fme EXPERICA MATERIALE ELETTRICO

IP65 CE MAX 60W

IMT109

GB ***ROUND CEILING LAMP***

Notices

• Before installation, disconnect main power.
• If the ceiling lamp has been installed vertically, assure yourself that the lamp-holder is facing upward.

• Use only incandescent light bulbs with power not exceeding 60W; alternatively, you can use energy-saving bulbs up to PL11 with maximum length 145mm.

Instructions for the installation

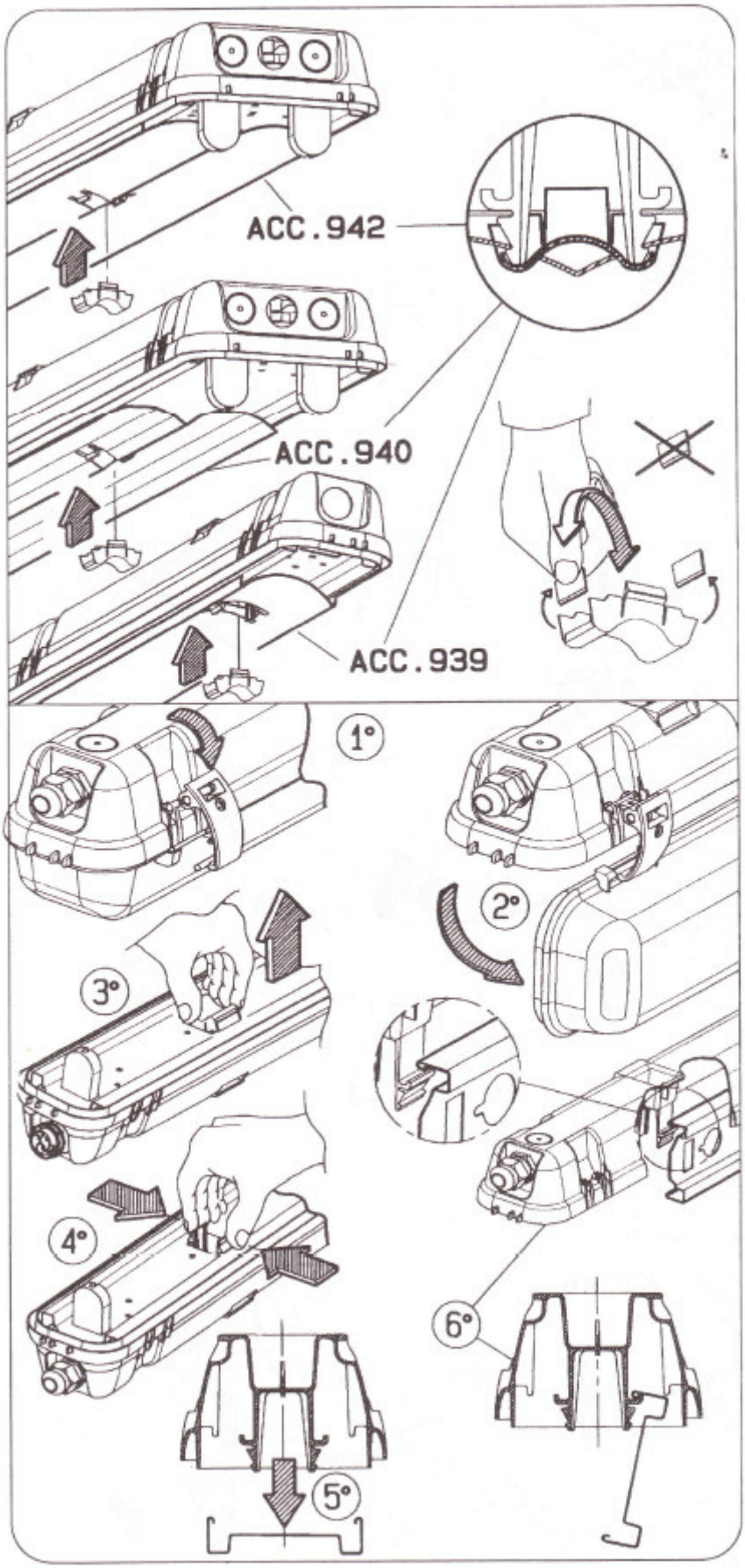
• Choose the cable's entry between one of the five knock out holes: in case you use the back entrance, put the supplied cable gland passing through the pre-set holes; in any other case, knock out one of the entrances and apply either cable gland or cable clamp, either PG9 or PG13.5.
• Insert the reflecting screen in the base by putting it in the four reference points.
• Fix the lamp holder in the fixing point by the supplied screw. • Fix the ceiling lamp to the wall by the perforations with centre distance 150 or with the coupling system (figure 1).
• Insert the insulating sheath on the wires (figure 2).
• Strip the wires for approximately 8mm, twist the copper strands and insert them completely in the lamp-holder's holes.
• Screw on the light-bulb.
• Position the supplied seal joining both the ends and positioning them near a coupler.
• Insert the cover on the seal and secure the four couplers.
• For product's servicing, open the lamp levering outward with the screwdriver (figure 3).

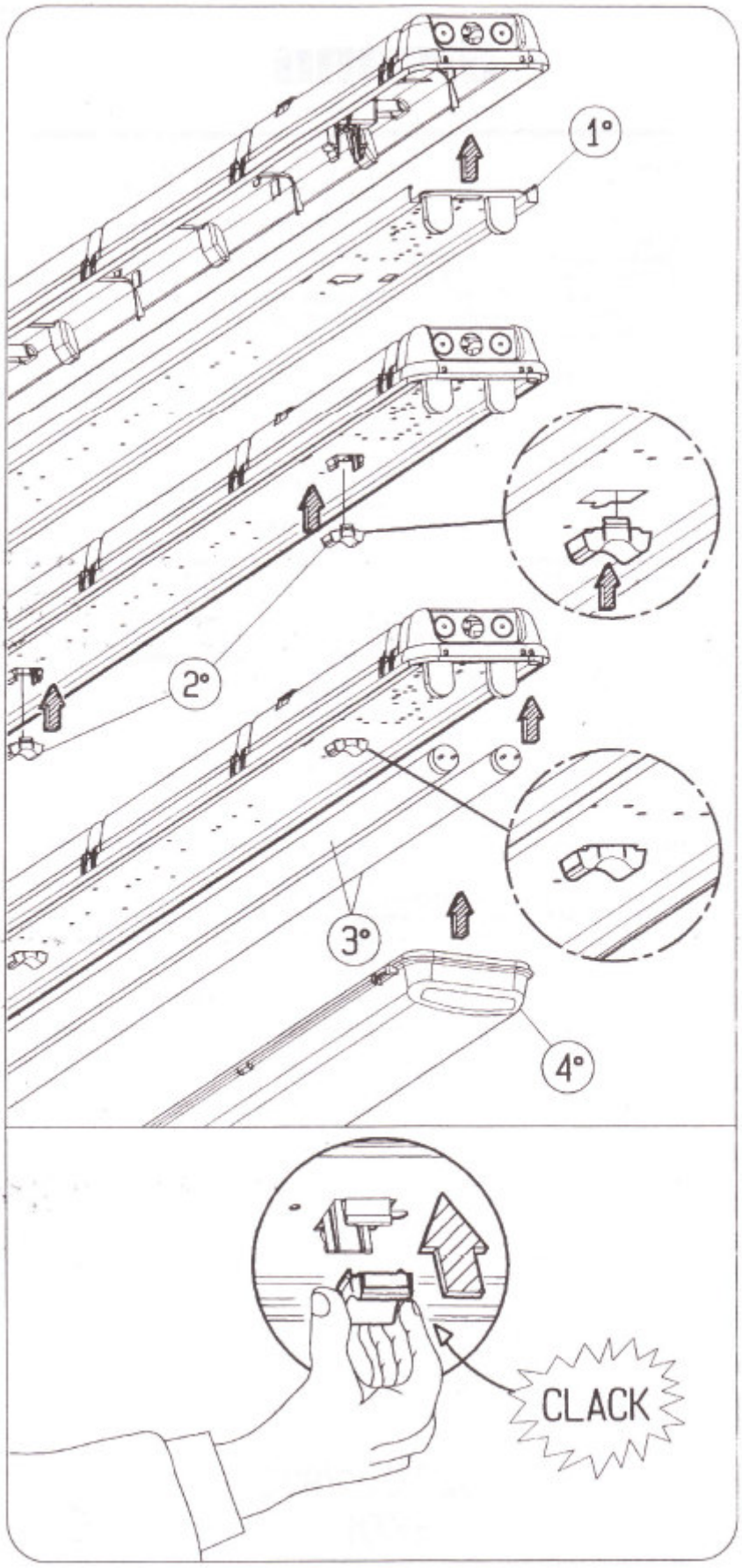
19.4 Fluorescent twin lamp

disano illuminazione

- Seguire attentamente le istruzioni per garantire un funzionamento corretto e sicuro.
- Conservare questo foglio per future necessità. Per eventuali problemi contattare il fornitore.
- Conservare l'etichetta dell'imballo per consentire la rintracciabilità del lotto di produzione, in caso di reclamo.
- Il prodotto non deve essere modificato. Qualsiasi modifica annulla la garanzia e può rendere pericoloso il prodotto.
- La DISANO ILLUMINAZIONE S.p.A. declina ogni responsabilità per i danni causati da un proprio prodotto montato in modo non conforme alle istruzioni.
- L'installazione dei prodotti deve essere eseguita a regola d'arte.

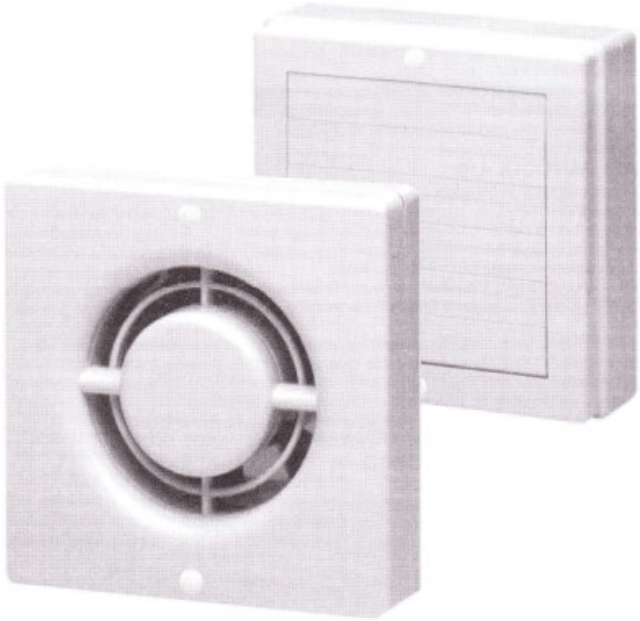
- Follow the instructions carefully to ensure correct and safe operation.
- Keep this sheet for future needs. Contact the supplier for any problem.
- Keep the packing label to allow for production batch tracking in the event of a complaint.
- The fixture cannot be modified. Any modification will void the warranty and can make the product dangerous.
- DISANO ILLUMINAZIONE S.p.A. shall not be responsible for any product damages caused by mounting procedures which are not in accordance with instructions.
- Product installation shall be performed in a workmanlike fashion.


ACC.942
ACC.940
ACC.939
1°
2°
3°
4°
5°
6°


1°
2°
3°
4°
CLACK

19.5 Extractor fan

ASPIRMURO - ASPIRMURO MATIC



CE

ATTENZIONE!	NEI MODELLI MATIC, LE PALETTE SI APRONO E SI CHIUDONO PROGRESSIVAMENTE DOPO CIRCA 30 SEC.
ATTENTION!	DANS LES MODELLES MATIC LES AILETTES S'OUVRENT ET SE FERMENT D'UNE FAÇON GRADUELLE APRES 30 SEC. ENVIRON.
ATTENTION!	IN THE MATIC MODELS THE SHUTTERS PROGRESSIVELY OPEN AND CLOSE AFTER APPROXIMATELY 30 SECONDS.
ACTHUNG!	FÜR DIE MATIC MODELLEN DIE GITTER ÖFFNEN UND SCHLIEßEN SICH SCHRITTWEISE NACH ETWA 30 SEKUNDEN.

aspira

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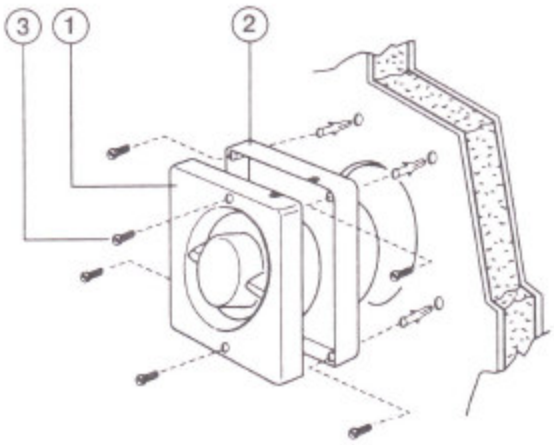
Tel. +39.011.238.78.11 - Fax +39.011.238.78.70 - www.aspira-online.com - e-mail : info-tecno@aspira-online.com

ASPIRMURO



GENERAL WARNINGS

GB

- Read carefully the instructions in this booklet as they give important information on the correct installation, use and maintenance of the appliance. Keep this booklet in a safe place so that it will be available for future reference.
- After unpacking check the integrity of the set. In case of doubt do not use the set and ask for qualified person's intervention. All the packaging (plastic bags, polystyrene foam, nails, etc) must be kept out of the reach of children.
- Before connecting the appliance to the mains supply ensure that the rating label specifications correspond to your electrical supply. (The rating label is to be found on the top part of the motor holder).
- This appliance must only be used for the purpose for which it was designed i.e. ventilation of rooms. All other uses must be considered to be potentially dangerous. The Manufacturer cannot be held responsible for any damage caused by improper, incorrect or unreasonable use.
- The safe use of any electrical appliance involves the observing of certain basic rules, in particular:
- Do not touch the appliance with wet or moist hands or feet.
- Do not use the appliance with bare feet.
- Do not pull the plug from the power socket by the mains lead of the appliance itself.
- Do not leave the appliance where it is exposed to adverse elements such as rain, salt etc.
- Do not let young children, aged or infirm people use the device without supervision.
- Before beginning any cleaning or maintenance operations disconnect the appliance from the electrical supply by taking out the plug or switching off the appliance insolation switch.
- In case of a fault and/or malfunction of the appliance, switch it off but do not attempt to rectify. Seek advice from a suitably qualified person. If repair is necessary contact the Manufacturer and ask for only original spare parts. If the above action is not carried out, the safety of the appliance could be jeopardized.
- Should it be decided not to use this appliance any longer, it should be removed from the electrical supply and rendered inoperative, then disposed of in the normal manner. It is also recommended to make harmless those parts of the appliance which could be harmful, especially to children who might play with the disused appliance.
- The installation must conform to the requirements of the latest issue of the I.E.E. wiring regulations.
- This appliance has been constructed to comply with the requirements of the following European Directives CEE 73/23 + CEE 93/68, CEE 89/336 + CEE 93/68.
- The set is workmanlike manufactured. A correct use and a regular maintenance guarantee life and reliability of all electrical and mechanical parts.

SPECIAL WARNINGS

- Installation must be carried out as detailed in these instructions. The user is warned that incorrect installation could cause harm to persons or animals or damage to property. The Manufacturer cannot be held responsible in such cases.
- The apparatus is double insulated (Class II) and does not require earthing.
- Check that the current carrying capacity of the mains wiring and socket are adequate for the maximum rating of the device shown on the rating label. In case of doubt consult a suitably qualified person.
- When installing, it is necessary to use a double pole switch with a contact separation of 3 mm or more.
- Do not leave the appliance plugged if unnecessary. Switch off the main switch of the appliance when the appliance is not in use.
- Do not obstruct the air inlet or outlet grilles.
- In conformity with prevention and safety laws in force, when installation of exhaust fan is completed, make sure that it is not at all possible to reach the motion parts from the inlet side. On the contrary it is necessary to mount the special protection shutter (cod. AP0885, AP0893, AP0901).
- If there is already a combustion fuel appliance in the room, it is essential to ensure that the air supply to the room is adequate for the correct functionning of both the combustion appliance and the fan. Do not install the fan in the same duct where gas appliance fume is conveyed. The appliance must discharge into a single exhaust pipe or directly outside the building.
- The system can be either wall-mounted or ceiling-mounted.

INSTALLATION AND ELECTRIC CONNECTION

- Install the extractor fan at least 2,3 m above the floor level.
- Remove the screw-covers. Separate the cover (1) from the motor housing (2) by removing the screws (3).
- Insert the motor housing (2) so that it corresponds with the outlet hole, by means of screws and adequate expansion plugs (Fig. 1)
- For glass-mounted type (Fig. 2): fasten, with the four screws (5) supplied, the motor holder (2) on the flange (4) with the accessory ASPIRKIT VETRO "G" or "F" already mounted.
- If connecting with outside wiring, break off one of the two plastic parts (E) of the motor support in order to pass the cable (Fig. 5).
- Fasten the feed cable by means of a cable-clip and connct to the terminal block (Fig. 3). In case of feed-cable-strap type, overtum the cable-clip.
- If the input power line is under chase, break off the plastic part (F) of the motor support, in order to pass the wiring (Fig. 5).
- Insert cover (1) and tighten screws (3). Insert the screw-covers.
- **MAINTENANCE:** After having disconnected the power supply, using the greatest care, wash every dirty part in water with neutral washing liquid. NEVER IMMERSE ELECTRICAL PARTS IN WATER OR OTHER LIQUIDS.
- **ALL MODELS CAN BE FITTED WITH THE FOLLOWING ACCESSORIES:**
  ASPIRKIT VETRO G10/4" - G12/5" - G15/6": Accessories for glass mounting of the ASPIRMURO scric.
  ASPIRKIT VETRO F10/4" - F12/5" - F15/6": Accessories for glass mounting of the ASPIRMURO MATIC serie.
  ASPIRTIMER: Accessory for timerization of the ASPIRMURO and ASPIRMURO MATIC series also for glass-mounted models.

OPERATING INSTRUCTIONS FOR MODELS WITH TIMER

On the models with ASPIRTIMER the operating time is originally set for about 45 seconds.
Normal operation is ensured also with no bulb or with a burnt out bulb.
The ASPIRTIMER switches on the fan when the light is turned on.
When the light is turned off, the fan continues to operate, for the programmable time, from 45 sec. to 30 min.
To prolong the operation time, proceed as follows:

- Disconnect the power supply.
- Turn the trimmer (6) on the ASPIRTIMER carefully with a screw-driver in the direction of the arrow (Fig. 4).
- Verify if the operational time has been correctly set, if not repeat following the instructions carefully.
- The installation and the electrical connection are illustrated on Fig. 4.

MODELS WITH PULL-CORD

- The electrical connection is illustrated on Fig. 3. It is only necessary to exclude the one-pole switch (A) as described on the electrical scheme.

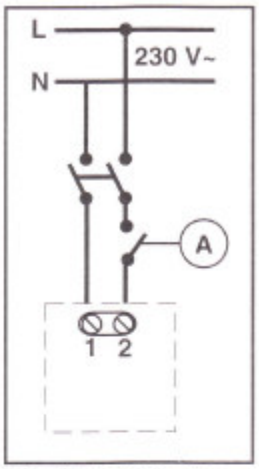
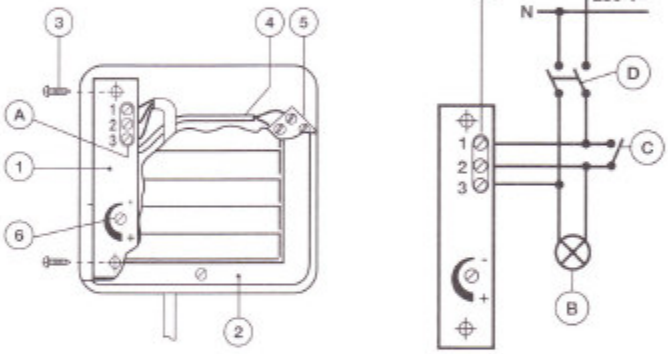


Fig./Abb./Afb. 3

Fig./Abb./Afb. 4



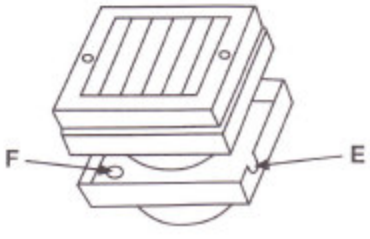
A - MORSETTIERA ASPIRTIMER
ASPIRTIMER CLAMPBOARD
BOÎTE A BORNES ASPIRTIMER
ASPIRTIMER KLEMMBRETT
KLEMMENSTRIP VAN ASPIRTIMER
TERMINALER ASPIRTIMER

B - LAMPADA DI ILLUMINAZIONE
BULB
LAMPE
LAMPE
LAMP
PÆRE

C - INTERRUTTORE DI COMANDO
SWITCH
INTERRUPTEUR
SCHALTER
BEDIENINGSSCHAKELAAR
KONTAKT

D - INTERRUTTORE GENERALE
MAIN SWITCH
INTERRUPTEUR GENERAL
HAUPTSCHALTER
HOOFDSCHAKELAAR
HOVEDAFBRYDER

Fig./Abb./Afb. 5



19.6 Socket outlet for shaver

bticino PROFESSIONISTI

CODICE ARTICOLO
AM5460

CATEGORIA
Installazione: apparecchi casa e ufficio > Màtix

DESCRIZIONE
presa per rasoio con trasformatore di isolamento - ingresso 230V a.c. 50/60Hz - uscita 115/230V a.c. 20VA

CARATTERISTICHE TECNICHE

Tensione	230V
Moduli	N°3

I prodotto qui illustrati sono costruiti a regola d'arte in materia di sicurezza ai sensi delle leggi 186 del 1/3/1968 e 791 18/10/1977 e, se installati e utilizzati in modo corretto, conformemente alla loro destinazione e sottoposti a manutenzione non difettosa, salvaguardando la sicurezza delle persone, degli animali e dei beni. Pertanto sulla base di quanto sopra tali prodotti sono da ritenersi conformi alle prescrizioni della Legge 46/90

Gli apparecchi a catalogo che sono soggetti ai requisiti della direttiva comunitaria sulla Compatibilità Elettromagnetica (89/336/CEE 93/68/CEE) sono marcati CE. Sono inoltre marcati CE tutti gli apparecchi a cui può essere applicata la direttiva comunitaria Bassa Tensione (73/23/CEE, 93/68/CEE).

PRESA RASOIO

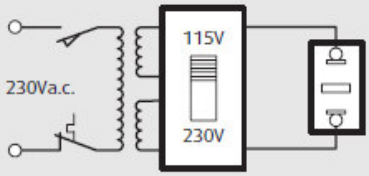
AXOLUTE	LIVING	LIGHT	LIGHT TECH	MÀTIX-MAGIC	LUNA
HC/HS4177	L4177	N4177	NT4177	AM5460 - A5460	—

Il trasformatore si inserisce in rete solo a spina innestata mediante tasto per evitare inutili autoconsumi, riscaldamenti e ronzii ed é protetto da un dispositivo ad effetto termico che disinserisce automaticamente il primario quando il prelievo supera i 20VA.
Il reinserimento avviene automaticamente dopo il tempo di raffreddamento del dispositivo di protezione.
Questo apparecchio ha il suo campo d'impiego tipico in alberghi, pensioni e similari, sia per motivi di sicurezza del cliente che per evitare l'utilizzazione abusiva della presa di corrente del bagno.

Dati tecnici

Trasformatore da 20VA:
- primario 230V a.c. ± 10% 50Hz
- 2 secondari a 115V o 230V a.c. selezionabili mediante commutatore.
- sezione max dei conduttori: 2,5 mm²

Schema di collegamento



19.7 Thermostatic mixing valve

CALEFFI SOLAR

www.caleffi.com 28055.01

Miscelatore termostatico regolabile per impianti solari	I
Adjustable Thermostatic Mixing Valve for solar systems	GB
Regulierbarer Thermomischer für Solaranlagen	D
Mitigeur thermostatique réglable pour installations solaires	F
Mezclador termostático regulable para instalaciones solares	E
Misturadora termostática regulável para instalações solares	P
Thermostatische mengventiel voor zonne-energiesystemen, regelbaar	NL

2521 Series

The thermostatic mixing valve is used in solar systems for producing domestic hot water. Its function is to maintain the temperature of the mixed water supplied to the user constant at the set value when there are variations in the supply conditions of the incoming hot and cold water. This special series of mixers can function continuously at the high temperatures of the incoming hot water from the solar reservoir.

Product Range

252140 *1/2"*
252150 *3/4"*

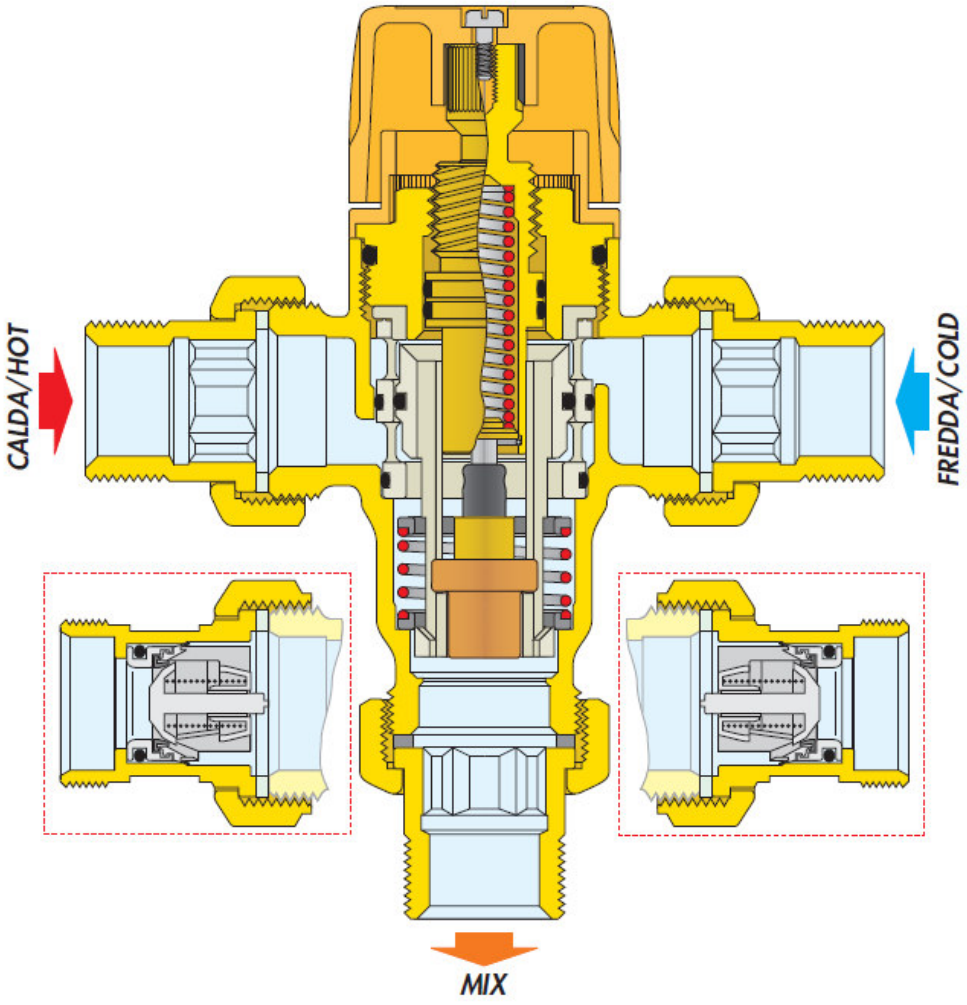
252153 *3/4" With check valves*

Materials

· Body:	DZR alloy UNI EN 12165 CW602N, chrome plated
· Shutter:	PSU
· Springs:	Stainless steel
· Seals:	EPDM

Technical Characteristics

· Setting range:	30÷65°C
· Tolerance:	±2°C
· Max working pressure (static):	14 bar
· Max working pressure (dynamic):	5 bar
· Min working pressure (dynamic):	0,2 bar
· Max inlet temperature:	100°C
· Maximum inlet pressure ratio (H/C or C/H):	2:1
· Minimum temperature difference between hot water inlet and mixed water outlet for optimum performance:	15°C



Caratteristiche idrauliche

Hydraulic Characteristics

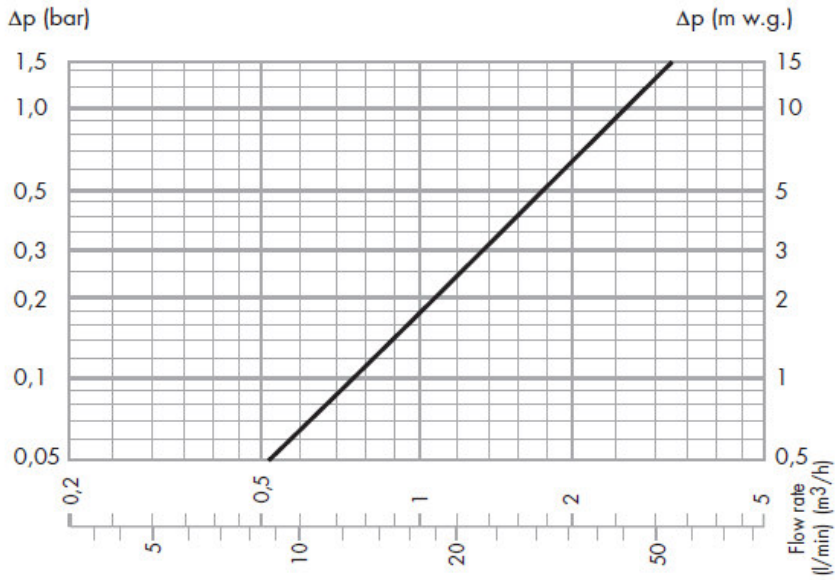
Hydraulische Eigenschaften

Caractéristiques hydrauliques

Características hidráulicas

Características hidráulicas

Hydraulische kenmerken



Kv = 2,6 (m³/h)

The 2521 series mixing valves are generally installed at the hot water outlet of the solar reservoir so as to ensure constant temperature of the mixed water distributed for use.
The Caleffi 2521 series thermostatic mixing valves, because of their flow characteristics, can be installed to control temperature either for individual uses (e.g. washbasin, bidet, shower) or for multiple user fittings. In order to guarantee the delivery of mixed water at the set temperature, the thermostatic mixer must have a minimum flow rate of 5 l/min.

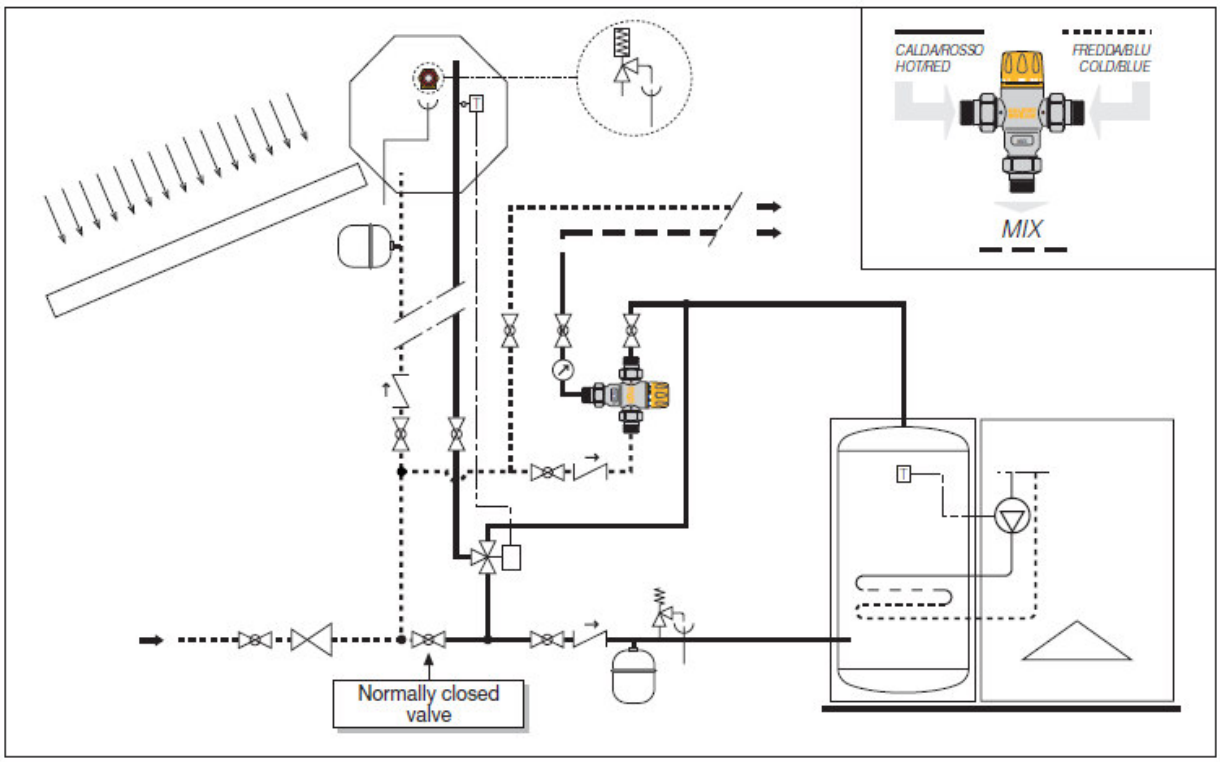
Before installing a Caleffi 2521 series mixing valve, the system must be inspected to ensure that its operating conditions are within the range of the mixer, checking, for example, the supply temperature, supply pressure, etc.

⚠ Systems where the Caleffi 2521 series mixing valve is to be fitted must be drained and cleaned out to remove any dirt or debris which may have accumulated during installation.
Failure to remove dirt or debris may affect performance and the manufacturer's product guarantee.
The installation of filters of appropriate capacity at the inlet of the water from the mains supply is always advisable.
In areas which are subject to highly aggressive water, arrangements must be made to treat the water before it enters the valve.

Caleffi 2521 series mixing valve must be installed in accordance with the diagrams in this manual, taking into account all current applicable standards.
Caleffi 2521 series mixing valve can be installed in any position, either vertical or horizontal.
The following are shown on the mixer body:
- Hot water inlet, colour red and marked “HOT”.
- Cold water inlet, colour blue and marked “COLD”.
- Mixed water outlet, marked “MIX”.

It is essential that access to the valve is totally unobstructed for any maintenance which may be required to the valve or connections. The pipework from/to the valve must not be used to support the weight of the valve itself.
In thermostatic mixing valve equipped systems the check valves need to be fitted to avoid undesirable circulation and back flow. Thermostatic mixer valves are also available in versions with non-return valves on the built-in hot and cold inlets.

Schema applicativo - Application Diagrams - Einbaubeispiel - Schémas d'application - Esquema aplicativo - Esquemas aplicativos - Toepassingsschema



After installation, the valve must be tested and commissioned in accordance with the instructions given below, taking into account current applicable standards.

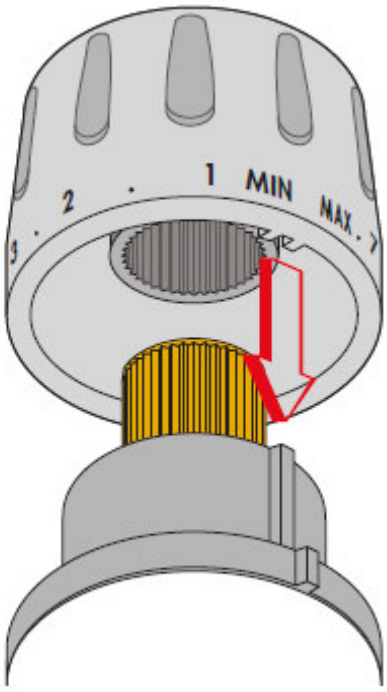
1) Ensure that the system is clean and free from any dirt or debris before commissioning the thermostatic mixer.
2) It is recommended that the temperature is set using a suitable calibrated digital thermometer. The valve must be commissioned by measuring the temperature of the mixed water emerging at the point of use.
3) The maximum outlet temperature from the valve must be set taking account of the fluctuations due to simultaneous use. It is essential for these conditions to be stabilised before commissioning.
4) Adjust the temperature using the adjusting knob on the valve.

Setting the temperature The temperature is set to the required value by means of the adjusting knob with the graduated scale on the top of the valve.

Pos.	Min	1	2	3	4	5	6	7	Max
T (°C)	27	32	38	44	49	53	58	63	67

with: $T_{HOT} = 68°C$ · $T_{COLD} = 13°C$ · $P = 3$ bar

Position the handle to the number required. Unscrew the head screw, pull off the handle and reposition it so that the handle fits into the internal slot of the knob. Tighten the head screw.



Maintenance

In service tests should be carried out regularly to monitor the mixer performance, as deterioration of performance could indicate that the valve and/or the system require maintenance. If, during these tests, the temperature of the mixed water has changed significantly in comparison with the previous test, the details given in the installation and commissioning sections should be checked and maintenance carried out.

The following aspects should be checked regularly to ensure that the optimum performance levels of the valve are maintained. Every 12 months at least, or more often if necessary.

1) Check and clean the system filters.
2) Verify that any check valves positioned upstream of the Caleffi valve are operating correctly, without problems caused by impurities.
3) The Caleffi valve should not be dismantled. Limescale can be removed from internal components by immersion in a suitable de-scaling fluid.
4) When the components which can be maintained have been checked, commissioning should be carried out again.

Leave this manual for the user.

The thermostatic mixer must be installed by a licensed plumber in accordance with national regulations and/or relevant local requirements.

If the thermostatic mixer is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.

Make sure that all the connecting pipework is water tight.

When making the water connections, make sure that the mixer connecting pipework is not mechanically over-stressed. Over time this could cause breakages, with consequent water losses which, in turn, could cause harm to property and/or people.

Water temperatures higher than 50°C can cause serious burns.

During the installation, commissioning and maintenance of the thermostatic mixer, take the necessary precautions to ensure that such temperatures do not endanger people.

In the case of highly aggressive water, arrangements must be made to treat the water before it enters the thermostatic mixer, in accordance with current legislation. Otherwise the mixer may be damaged and will not operate correctly.

EDILSIDER S.p.A.
PREFABRICATED BUILDINGS

SINGLE MODULE BUILDING

ASSEMBLING, DISASSEMBLING AND RE-PACKAGING USER'S MANUAL

Document ID: EDIL.76.07.1.EN_Rev.00 dated 11-06-2007

Language: English

for

UNITED NATIONS NATIONS UNIES

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1. HOW TO USE THIS MANUAL

This manual contains the following graphic symbols:

Caution, danger:
Indicates situations or behavior that may put the user in danger

Warning:
Indicates useful information for the user

2. GENERAL WARNINGS

This manual has the scope of guiding the workers in the assembling, disassembling and re-packaging procedures of the prefabricated buildings. Lack of respect for the instructions contained in the manual will remove the manufacturer from any and all responsibility.
The maneuvers for installation of the various parts and equipment are carefully described in this manual and have been studied bearing in mind the weight and footprints of the pieces to be moved, as well as the time to perform each operation.
The devices aimed at facilitating the completion of the various operations are supplied with the equipment. The maneuvers request a minimum number of three workers. Should these indications be not respected, the operations may become dangerous.
The workers involved to perform a specific procedure must constantly communicate with each other, monitoring the correct procedure of the operation.
It is necessary that one operation is performed at a time, in order to avoid that the workers are placed in danger.

3. CONTENTS

Each 20 feet ISO Standard Shipping Container contains all the components necessary to assemble three Single Module Buildings.
The components necessary to assemble one Single Module Building are listed in the following pages. Pictures help the users to identify and sort the components on installation site.

4. ASSEMBLING PROCEDURE

The buildings are capable of being easily erected in a very short time completely by hand, without need for any kind of heavy mechanical equipment.
Construction time for the Single Module Building will not exceed four hours with a skilled team of 3 workers.

Minimum recommended hand tools:

- Battery or electric drill/driver

- Bits hexagon socket 7 and 10 mm
- Bits for cross head Phillips® screws

- Holesaw for metal 20 mm complete of arbour with centre drill

- Battery or electric jig saw
- Blades for metal

- Cutter with blades

- Open jaw wrenches 13 mm
- Double ended offset tubular box wrenches 13 mm

- Hammer

The assembling steps are described in the following:

Step 1 – Position the foundation concrete blocks (if included in the supply) according to the dimensions shown in the attached drawing #1.
As an alternative, it is possible to cast on site a concrete slab, perfectly flat, whose dimensions are 3500x7130 mm and minimum height of 100 mm.

Warning

When positioning the concrete blocks it is recommended to check that the level is the same for all. It is also required that the soil under the building is perfectly draining and well ventilated.

Step 2 – Assemble the supporting structure on the ground, as shown in the drawing #2. First bolt the initial and final pillars (items 5 & 7) with the junction element for corner (item 10) using the bolts M8x30 complete of nut and washers (see detail “A”).

Step 3 – Bolt the central pillars (item 6) with the junction element for central floor beam (item 12) using the bolts M8x30 complete of nut and washers (see detail “B”).

Step 4 – Bolt the central floor beam (item 3) with the junction element for central floor beam (item 11) using the bolts M8x30 complete of nut and washers (see detail “B”).

Step 5 – Take the initial pillar and bolt it in the corner at the base to the main floor beam (item 1) and to the initial-final head floor beam (item 2). This operation must be repeated also for the pillar in the opposite side (see detail “A”).

Step 6 – Bolt the central cross beams (item 4) to the two main floor beams (item 1). See detail “E”.

Step 7 – Erect the central pillars (item 6).

Warning

During the erection of the central pillars, take care to bolt together the main floor beams (item 1), the central cross beam (item 3) and the central pillar (item 6). See detail “B”.

Step 8 – The above operations must be repeated until the floor structure is completed.

Step 9 – Lift the floor structure and position it above the foundation concrete blocks.

Step 10 – Check that the floor structure is perfectly levelled.

Step 11 – If the floor is not perfectly levelled, place some shims under the floor structure.

Step 12 – Place the lower U-shaped guides (items 18 & 19) on the external perimeter of the floor keeping them 23 mm far from the external border of the floor structure, as shown in the drawing #3. Fix them to the structure using self-threading screws with hexagonal head Ø4,2x19 every 45 cm approx. (see detail “F”).

Step 13 – Assemble the step floor. Take the floor polyurethane sandwich panels 30 mm thick and place them above the floor structure.

Warning

Floor panels must be cut with a jig saw min. 60x110 mm at the corners and min. 60x55 mm at the centres near the vertical pillars.

Step 14 – Start with the first panel 1000 mm wide taking care to place the side with the groove against the longitudinal U-shaped lower guide.

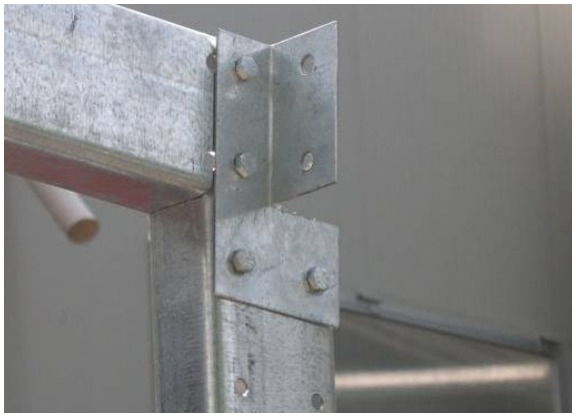
Step 15 - Proceed in this way until the floor is completed.

Step 16 – Lay down the PVC sheet above the floor panels.

Step 17 – Cut the PVC sheet near the vertical pillars.

Step 18 – Bolt the corner junction elements pillar-roof right/left (item 13) at the top of the four corner pillars (items 5 & 7). See detail “C” on drawing #2.

Step 19 – Bolt the central junction elements pillar-roof (item 14) at the top of the central pillars (item 6). See detail “D” on drawing #2.



Step 20 – Starting from the corner, bolt the main roof beams (item 8) to the junction elements at the corner and at the centre.

Step 21 – Bolt the junction element for cross roof beams (item 15) both to the main roof beam (item 8) and to the junction element central pillar-roof (item 14).

Step 22 – Complete the installation of the roof structure at the corner bolting the head roof beams (items 9).

Step 23 – Complete the installation of the roof structure at the centre bolting the central roof beam (item 9).

Step 24 – The supporting structure is now completed.

Step 25 - Assemble the wall panels, as shown in the drawing #4. Place the first wall sandwich panel on the long side of the building (item 20_1) inside the lower U-shaped guide keeping the tongue towards the lower short side of the building.

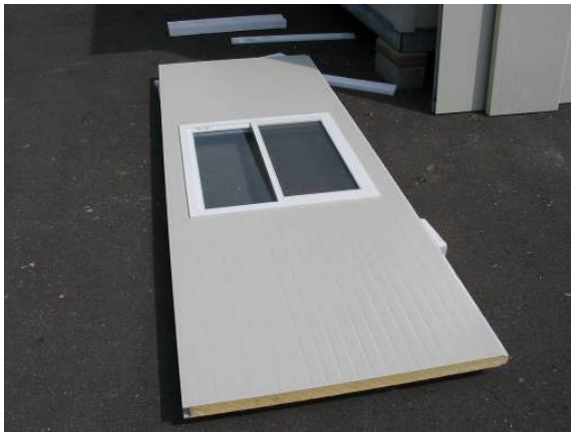
Step 26 – Proceed placing all the other panels until the longitudinal wall is completed (items 20_2, 20_3, 20_4, 20_5, 20_6, 20_7), taking care to keep it in vertical position. Screw all the panels at the base using two self-threading screws with hexagonal head Ø4,2x19 (see detail “G”).

Step 27 – Place the upper corner flashings (items 34) at the top of the wall panels. See detail on drawing #5.

Step 28 – Each flashing must be fixed to the structure using five self-threading screws with hexagonal head Ø4,2x19 for each side of the profile.

Step 29 – Repeat the same procedure assembling the other long side wall.

Step 30 – Assemble the lower short side wall. Insert the wall sandwich panel with opening for Air Conditioner (item 21_1) inside the lower U-shaped guide keeping the groove towards the corner of the building. See drawing #4.



Step 31 – Position the wall sandwich panel with the window (item 21_2).

Step 32 – Position the wall sandwich panel (item 21_3) and the special wall sandwich panel groove-smooth (item 21_4). Screw all the panels at the base using two self-threading screws with hexagonal head Ø4,2x19 (see detail “G”).

Step 33 – Place the upper corner flashings (items 36) at the top of the wall panels. See detail on drawing #5. Each flashing must be fixed to the structure using five self-threading screws with hexagonal head Ø4,2x19 for each side of the profile.

Step 34 – Assemble the upper short side wall. Insert the special wall sandwich panel (item 22_1) inside the lower U-shaped guide keeping the smooth side towards the corner of the building. See drawing #4.

Step 35 – Position the door and over it the special wall sandwich panel (item 22_2).

Step 36 – Position the wall sandwich panel with the pre-fitted window (item 22_3).

Step 37 – Position the wall sandwich panel (item 21_4). Screw all the panels at the base using two self-threading screws with hexagonal head Ø4,2x19 (see detail “G”).

Step 38 – Place the upper corner flashings (items 36) at the top of the wall panels. See detail on drawing #5. Each flashing must be fixed to the structure using five self-threading screws with hexagonal head Ø4,2x19 for each side of the profile.

Step 39 – Place the threshold on the floor at the bottom of the door so that to cover the U- shaped guide and fix it to the guide itself with two self-threading screws with hexagonal head Ø4,2x19.

Warning

It is strictly recommended to follow the position of the wall sandwich panels shown in the drawings.

Step 40 – Stick the adhesive gasket on the external border of roof flashings. See detail “H” on drawing #5

Step 41 – Assemble to roof covering, as shown in the drawing #6. Place the first ribbed sandwich panel (item 24_2) so that the upper short side stay in the middle of the central cross roof beam (item 9) and the external long side comes out of 25 cm from the external border of the building.

Step 42 – Proceed to assemble all the other roof panels in the lower part of the building.

Step 43 – Stick the adhesive gasket on the polyurethane foam of the roof panels in the lower part of the building.

Step 44 – Assemble the roof panels in the upper part of the building (item 24_1) so that they overlap those previously put in place (see detail “M”).

Step 45 – Fix the roof panels using the self-screwing screws with hexagonal head Ø6,3x120 and the fixing elements (item 37) by the ribs of the roof panels, tacking care that the screws perforate the supporting roof beams. See details “I” – “L” – “M” – “N”.

Step 46 – Place the roof flashing (item 37) in the upper side as shown in detail “I” and fix it with self-threading screws with hexagonal head Ø4,2x19 to the roof panels every two ribs.

Step 47 - Place the vertical corner flashings (items 33_1 & 33_2) on the four corners of the building. Each flashing must be fixed to the structure using four self-threading screws with hexagonal head Ø4,2x19 for each side of the profile. See detail “H” on drawing #5.

Step 48 – The external building is now completed.

Step 49 – Proceed with the internal finishing. Place the skirting boards between the floor and the wall panels all around the internal perimeter of the building.

Step 50 – Place and fix to the floor panel by the vertical pillars the L-shaped elements (item 40) using self-threading screws with hexagonal head Ø4,2x19.

Typical for corner vertical pillars: one element only per pillar.

Typical for central vertical pillars: two elements per pillar.

Step 51 – Mount into the appropriate frame the window type Air Conditioner. The Air Conditioner shall protrude on the outside.

Warning

The Air Conditioner is provided with own Installation, Use and Maintenance Manual. Please refer to it for any additional information.

Step 52 – Mount on the ceiling the Battery Smoke Detector.

Warning

The Smoke Detector is provided with own Installation, Use and Maintenance Manual. Please refer to it for any additional information

Step 53 – Fix the powder fire extinguisher to the pillar.

Caution, danger of poisoning:

Do not direct the jet at people.
Do not breath the extinguishing agent vapors.

Warnings:

For more information on the use of the fire extinguisher, consult the instructions provided on the fire extinguisher.
The fire extinguisher load will last only a few seconds. For this reason it must be used in an efficient and knowledgeable manner.

Step 54 – Install the electrical system as shown in the drawing #11. The electrical installation is completely pre-wired. Each component is provided with brackets that shall be screwed to the structure. Start with the Main Distribution Board that shall be fixed in the corner near the Air Conditioner.

Step 55 – Fix all the distribution boxes at appropriate positions.

Step 56 – Fix all the boxes with the socket outlets at appropriate positions.

Step 57 – Fix the box with the light switches near the entrance door.

Step 58 – Fix the internal lighting fixtures using the appropriate metal clamps that shall be screwed to the ceiling.

Step 59 – Fix the corrugated conduits using the plastic clamps that shall be screwed to the panels/steel profiles.

Step 60 – Make an hole in the panel over the door, bring to the outside the cable and mount on the wall the external lighting fixture.

Step 61 – Make an hole in the panel over the Main Distribution Board and bring to the outside the cable for the connection to the power supply.

Caution:

- Do not use damaged cables or outlets.
- Do not use the power outlets before making sure they are dry, clean and perfectly integral.

5. DISASSEMBLING PROCEDURE

Unscrew the boxes, the lighting fixtures and the Main Distribution Board from the walls and remove the electrical installation from the inside of the building without disconnecting the cables.
Remove the skirting boards from all around the internal perimeter of the building and unscrew the L-shaped elements (item 38) from the floor by the vertical pillars.
Unscrew and remove the threshold on the floor at the bottom of the door.
Unscrew and remove the vertical corner flashings (items 33_1 & 33_2) at the four corners of the building, as shown on drawing #5.
Unscrew and remove the roof flashing (item 37) in the upper side, as shown on drawing #6.
Unscrew the roof fixing elements from the ribs of the roof panels and remove them.
Remove the roof panels in the upper part of the building (item 24_1) and then all the other roof panels in the lower part of the building (item 24_2).
Unscrew and remove the upper corner flashing (items 36) at the top of the wall on the upper short side, as shown on drawing #5.
Unscrew at the base and remove in sequence all the wall panels: the wall sandwich panel with the pre-fitted window (item 22_3), the wall sandwich panel (item 21_4), the door and the special wall sandwich panel (item 22_2), the special wall sandwich panel (item 22_1). See drawing #4.
Unscrew and remove the upper corner flashing (items 36) at the top of the other short side, as shown on drawing #5.
Unscrew at the base and remove in sequence all the wall panels: the wall sandwich panel (item 21_3), the special wall sandwich panel groove-smooth (item 21_4), the wall sandwich panel with the window (item 21_2), the wall sandwich panel with opening for Air Conditioner (item 21_1). See drawing #4.
Remove the upper corner flashings (items 34) at the top of the long sides, as shown on drawing #5.
Unscrew at the base and remove in sequence the wall panels (items 20_7, 20_6, 20_5, 20_4, 20_3, 20_2, 20_1), as shown in the drawing #4.
Dismantle the roof supporting structure. See drawing #2.
Unbolt the central roof beam (item 9) from the central junction elements pillar-roof (item 14).
Starting from the corner, unbolt the main roof beams (item 8) from the junction elements at the corner (item 13) and at the centre (item 14).
Unbolt the central junction elements pillar-roof (item 14) at the top of the central pillars (item 6).
Unbolt the corner junction elements pillar-roof right/left (item 13) at the top of the four corner pillars (items 5 & 7).
Remove the PVC sheet from the floor panels.
Remove the floor polyurethane sandwich panels starting from one side. See drawing #3.
Unscrew and remove the lower U-shaped guides (items 18 & 19) from the external perimeter of the floor.
Unbolt and knock-down the four pillars at corners and the two intermediate.
Dismantle the floor supporting structure. See drawing #2.
Unbolt the central cross beams (items 3/4) and the two head floor beams (item 2) from the main floor beams (item 1).
Remove the foundation concrete blocks (if included in the supply).

6. RE-PACKAGING PROCEDURE

All building components are suitable to be stored in a 20 feet ISO Standard shipping container. Please refer to the following instruction for the packaging procedure.

All the building components shall be packaged according to the following items (for details check the packing list):

Package 1 - 20 feet ISO Standard shipping container.

Package 2 – Steel components of floor, roof and wall supporting structure.

Package 3 – Sandwich type panels for wall and sandwich type panels for floor.

Package 4 – PVC sheathing rolls.

Package 5 – Sandwich type panels for roof and sandwich type panels for floor.

Package 6 – Sandwich type panels for wall, sandwich type panels with pre-fitted window and sandwich type panels with pre-fitted frame for AirCon.

Package 7 – External doors.

Package 8 – Concrete foundation blocks (if provided).

Package 9 – Air conditioner units.

Package 10 – Electrical system.

Package 11 – Miscellaneous (accessories, bolts, junction elements, etc).

Please refer to the following loading procedure:

- Load the package #2 with the steel components on the bottom left side of the shipping container.
- Place over it the package #3 with the sandwich type panels and the package #4 with the PVC rolls.
- Load the package #5 with the sandwich type panels on the bottom right side of the shipping container.

- Load the package #6 with the special sandwich panels in the front left side of the container over the package #2. Place some shims in the front under the package to keep it lifted from the floor.
- Load the package #7 with the external doors to complete the available space on the left side.

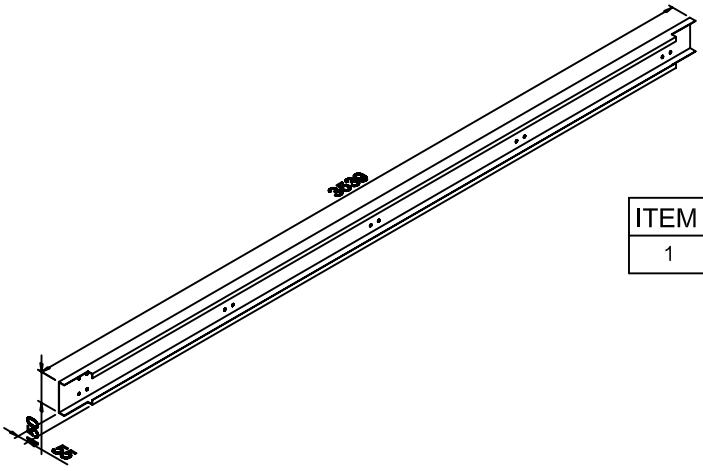
- Load all the other packages on the right sides: the concrete blocks and the junction elements at the bottom, then the air conditioners, the boxes with the electrical installation and all the other accessories.

Warning

It is strictly recommended to fasten all the packages in order to avoid damages during transportation.

PACKING LIST

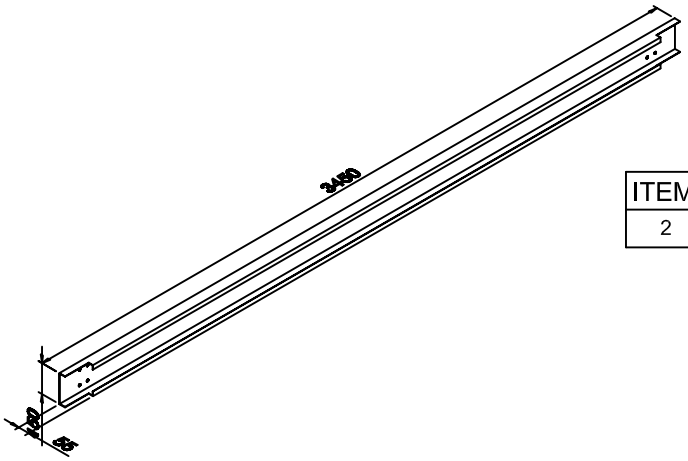
EDILSIDER S.P.A.



MAIN BEAM
FOR FLOOR

"C" shaped profile in galvanized steel 2 mm thick

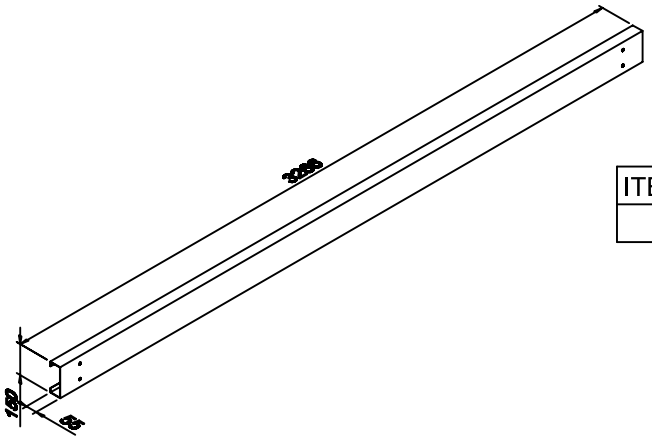
ITEM	QTY	ARTICLE	DIMENSIONS
1	4	FPNLP150_3539	150x55x3539



INITIAL-FINAL HEAD BEAM
FOR FLOOR

"C" shaped profile in galvanized steel 2 mm thick

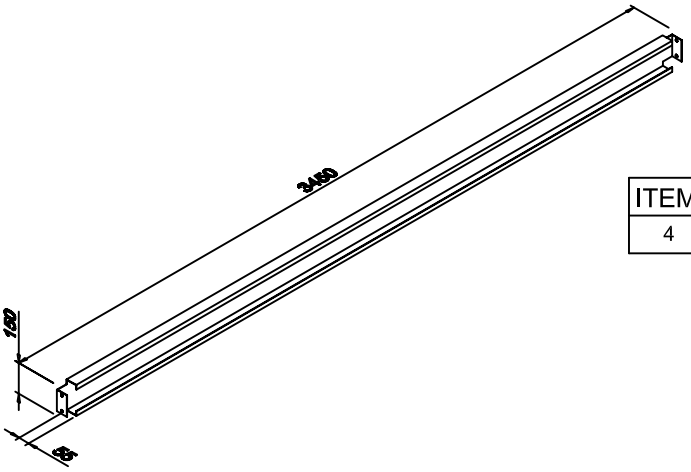
ITEM	QTY	ARTICLE	DIMENSIONS
2	2	FPNLP150_3450	150x55x3450



CENTRAL BEAM
FOR FLOOR

"C" shaped profile in galvanized steel 2 mm thick

ITEM	QTY	ARTICLE	DIMENSIONS
3	1	FPNLP150_3266	150x55x3266



CENTRAL BEAM
FOR FLOOR

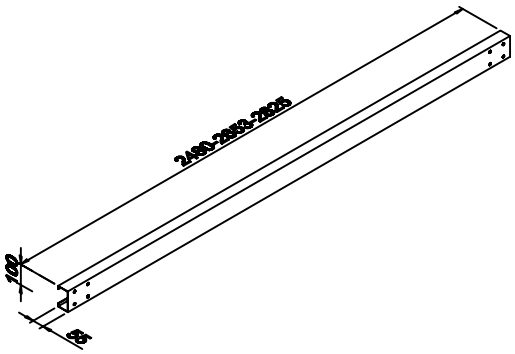
"C" shaped profile in galvanized steel 2 mm thick

ITEM	QTY	ARTICLE	DIMENSIONS
4	6	FPNLP150_3450	150x55x3450

EDILSIDER S.P.A.

INITIAL-CENTRAL-FINAL PILLAR

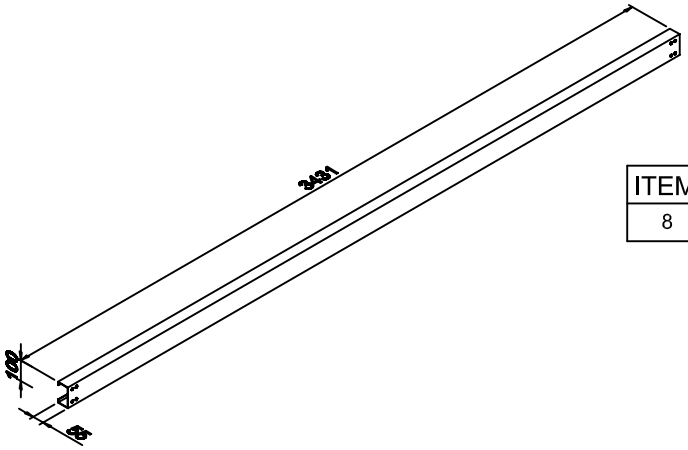
"C" shaped profile in galvanized steel 2 mm thick



ITEM	QTY	ARTICLE	DIMENSIONS
5	2	FPNLP100_2480	100X55X2480
6	2	FPNLP100_2653	100X55X2653
7	2	FPNLP100_2825	100X55X2825

MAIN BEAM FOR ROOF

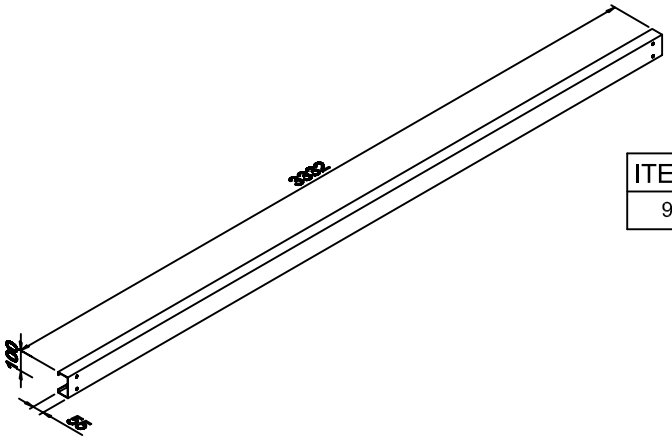
"C" shaped profile in galvanized steel 2 mm thick



ITEM	QTY	ARTICLE	DIMENSIONS
8	4	FPNLS100_3431	100x55x3431

INITIAL-CENTRAL-FINAL BEAM FOR ROOF

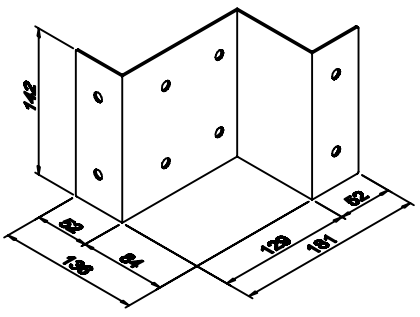
"C" shaped profile in galvanized steel 2 mm thick



ITEM	QTY	ARTICLE	DIMENSIONS
9	3	FPNLS100_3332	100x55x3332

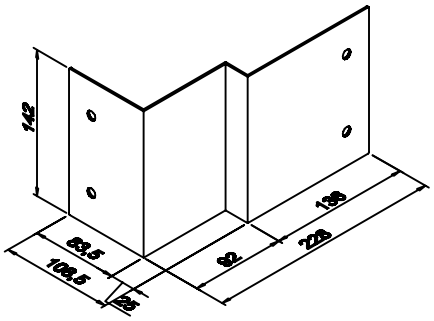
JUNCTION ELEMENT FOR CORNER FLOOR-PILLAR

Profile in galvanized steel 2 mm thick



ITEM	QTY	COD. ART.	DIMENSIONS
10	4	FGAPP307_142	307x142

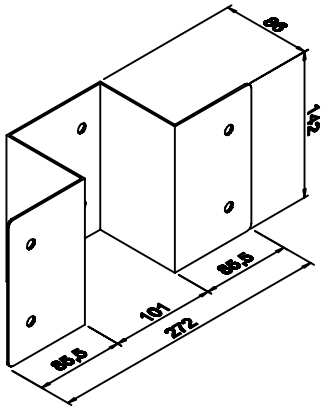
EDILSIDER S.P.A.



JUNCTION ELEMENT FOR CENTRAL FLOOR BEAM

Profile in galvanized steel 2 mm thick

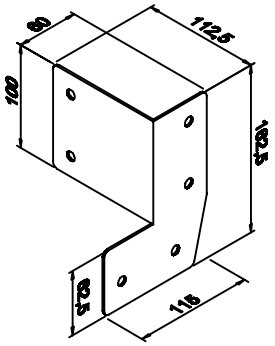
ITEM	QTY	ARTICLE	DIMENSIONS
11	2	FGCRP328_142	328.5x142



JUNCTION ELEMENT FOR CENTRAL FLOOR BEAM

Profile in galvanized steel 2 mm thick

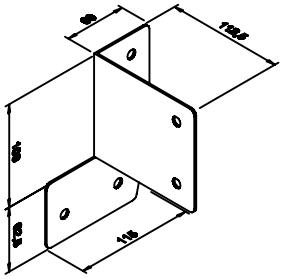
ITEM	QTY	ARTICLE	DIMENSIONS
12	2	FGCPP432_142	432x142



JUNCTION ELEMENT CORNER PILLAR-ROOF RIGHT

Profile in galvanized steel 2 mm thick

ITEM	QTY	ARTICLE	DIMENSIONS
13a	2	FGAPS168_162_DX	168.5x162.5

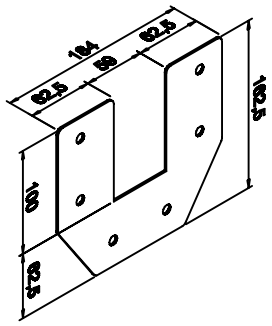


JUNCTION ELEMENT CORNER PILLAR-ROOF LEFT

Profile in galvanized steel 2 mm thick

ITEM	QTY	ARTICLE	DIMENSIONS
13b	2	FGAPS168_162_SX	168.5x162.5

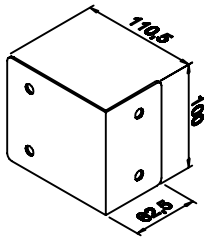
EDILSIDER S.P.A.



JUNCTION ELEMENT CENTRAL PILLAR-ROOF

Profile in galvanized steel 2 mm thick

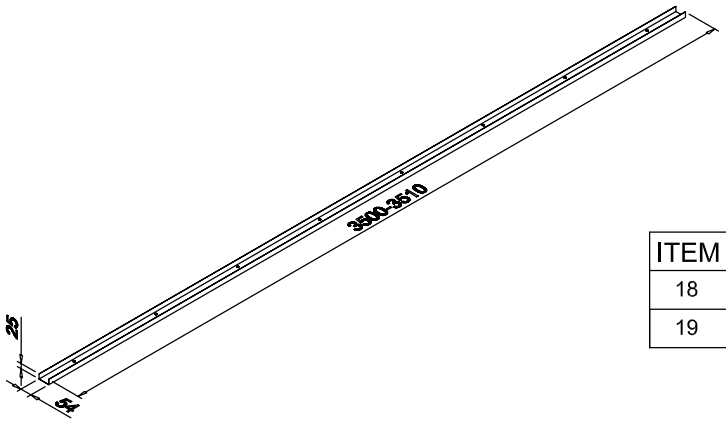
ITEM	QTY	ARTICLE	DIMENSIONS
14	2	FGCPS184_162	184x162



JUNCTION ELEMENT CENTRAL BEAMS OF THE ROOF

Profile in galvanized steel 2 mm thick

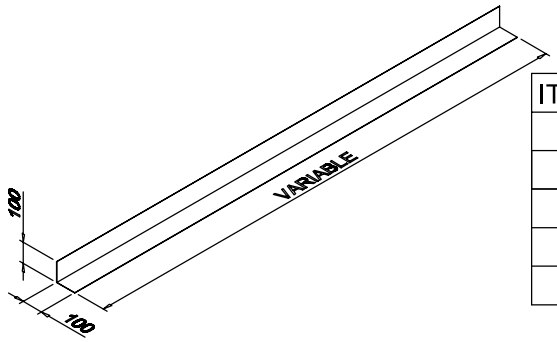
ITEM	QTY	ARTICLE	DIMENSIONS
15	2	FGCTS169_100	169x100



"U" SHAPED GUIDES LOWER PART

"U" shaped profile in galvanized steel 1 mm thick

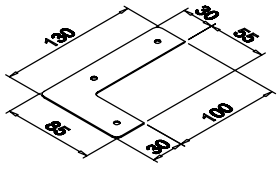
ITEM	QTY	ARTICLE	DIMENSIONS
18	4	FGB54_3510	25/54/25x3510
19	2	FGB54_3500	25/54/25x3500



EXTERNAL COVERING CORNER
UPPER CORNER COVERING FOR ROOF
ROOF DRIPPER

"L" shaped profile in galvanized steel 0.8 mm thick

ITEM	QTY	ARTICLE	DIMENSIONS
33_1	2	FANTA100_2425	100/100x2425
33_2	2	FANTA100_2775	100/100x2775
34	4	FANTA100_3510	100/100x3510
36	2	FANTA100_3500	100/100x3500
37	1	FANTA100_4075	100/100x4075

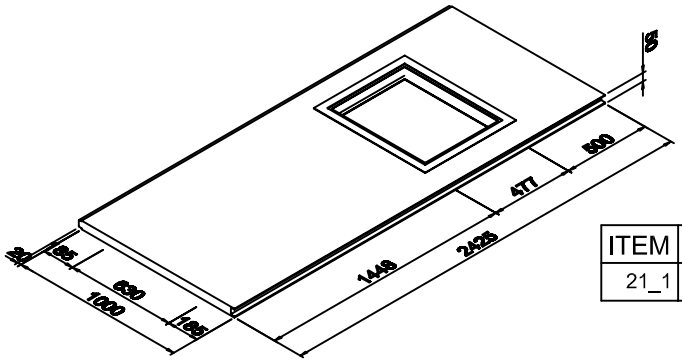


"L" SHAPED FLOOR ELEMENTS

Profile in galvanized steel 0.8 mm thick

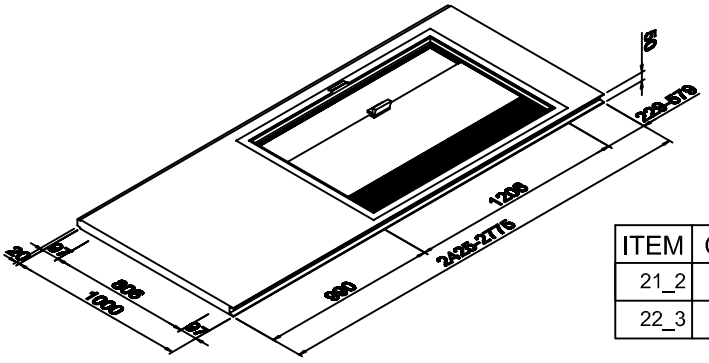
ITEM	QTY	ARTICLE	DIMENSIONS
40	8	FTAP85_130	85x130

EDILSIDER S.P.A.



WALL POLYURETHANE SANDWICH PANEL
FOR HVAC

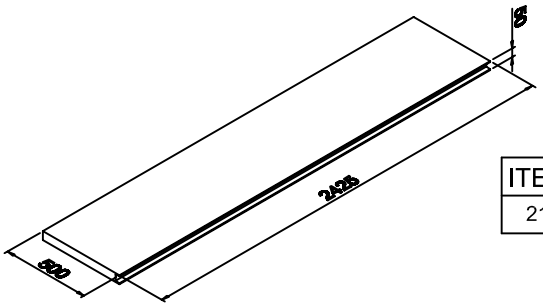
ITEM	QTY	ARTICLE	DIMENSIONS
21_1	1	PPAVC1000_2425_50	1000x2425x50



WALL POLYURETHANE SANDWICH PANEL
FOR WINDOW

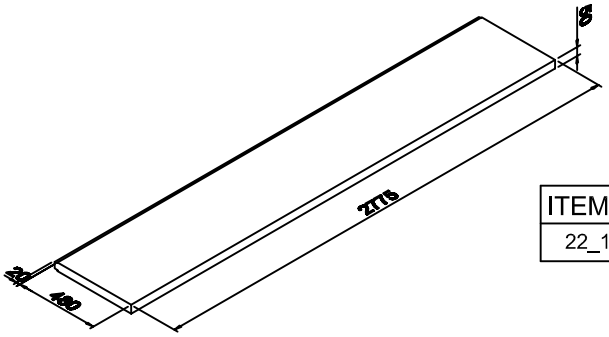
ITEM	QTY	ARTICLE	DIMENSIONS
21_2	1	PPAVF1000_2425_50	1000x2425_50
22_3	1	PPAVF1000_2775_50	1000x2775x50

WALL POLYURETHANE SANDWICH PANEL
SPECIAL (GROOVE-SMOOTH)



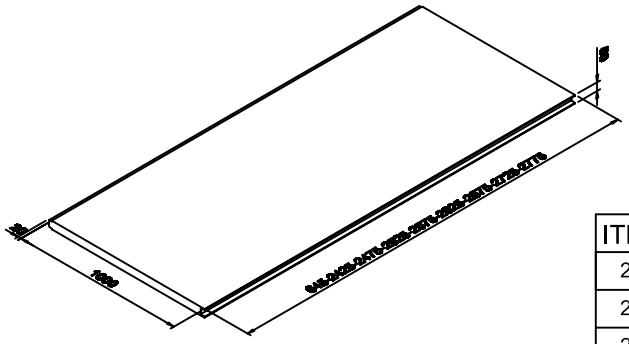
ITEM	QTY	ARTICLE	DIMENSIONS
21_4	1	PPAS500_2425_50	500x2425x50

WALL POLYURETHANE SANDWICH PANEL
SPECIAL (TONGUE-SMOOTH)



ITEM	QTY	ARTICLE	DIMENSIONS
22_1	1	PPAS480_2775_50	480x2775x50

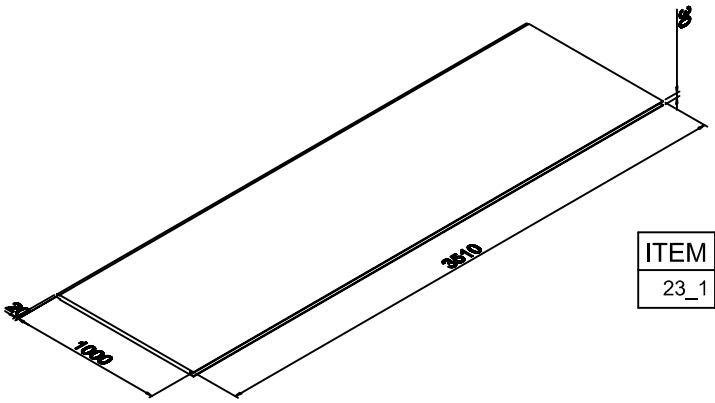
EDILSIDER S.P.A.



WALL POLYURETHANE SANDWICH PANEL

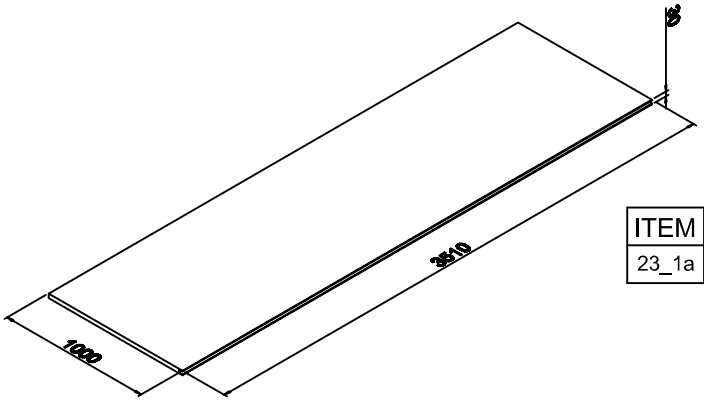
ITEM	QTY	ARTICLE	DIMENSIONS
22_2	1	PPA1000_645_50	1000x645x50
21_3	1	PPA1000_2425_50	1000x2425x50
20_1	2	PPA1000_2425_50	1000x2425x50
20_2	2	PPA1000_2475_50	1000x2475x50
20_3	2	PPA1000_2525_50	1000x2525x50
20_4	2	PPA1000_2575_50	1000x2575x50
20_5	2	PPA1000_2625_50	1000x2625x50
20_6	2	PPA1000_2675_50	1000x2675x50
20_7	2	PPA1000_2725_50	1000x2725x50
22_4	1	PPA1000_2775_50	1000x2775x50

EDILSIDER S.P.A.



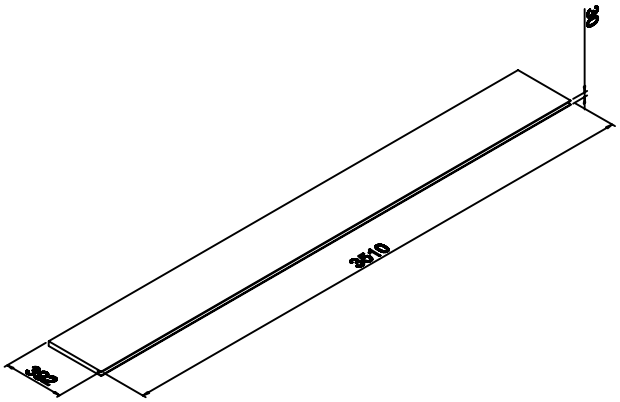
FLOOR POLYURETHANE SANDWICH PANEL

ITEM	QTY	ARTICLE	DIMENSIONS
23_1	5	PPV1000_3510_30	1000x3510x30



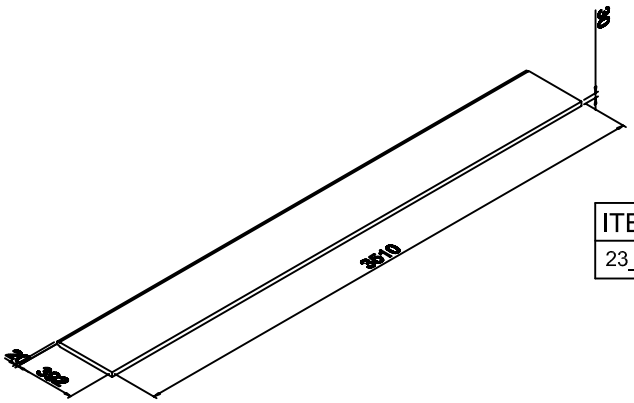
FLOOR POLYURETHANE SANDWICH PANEL
SPECIAL (GROOVE-SMOOTH)

ITEM	QTY	ARTICLE	DIMENSIONS
23_1a	1	PPVS1000_3510_30FD	1000x3510x30



FLOOR POLYURETHANE SANDWICH PANEL
SPECIAL (GROOVE-SMOOTH)

ITEM	QTY	ARTICLE	DIMENSIONS
23_2	1	PPVS392_3510_30FD	392x3510x30

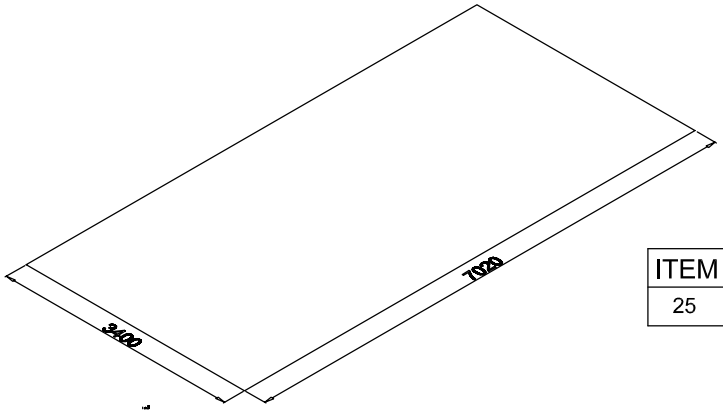


FLOOR POLYURETHANE SANDWICH PANEL
SPECIAL (TONGUE-SMOOTH)

ITEM	QTY	COD. ART.	DIMENSIONI
23_2a	1	PPVS392_3510_30DM	392x3510x30

EDILSIDER S.P.A.

PVC FLOOR COVERING



ITEM	QTY	ARTICLE	DIMENSIONS
25	1	PTPVC3400_7020	3400X7020